RAILROAD GAZETTE

FRIDAY, MAY 12.

Report of the Eastern Railroad Association.

The report of this Association for the year 1881 shows that at the close of the year the following companies were members of the Association:

Allegheny Valley.	N. Y. & N. England.
Baltimore & Ohio.	N. Haven & Northampton.
Boston & Albany.	New London Northern.
Boston, Concord & Montreal.	Northern Central.
Boston & Lowell.	Northern (N. H.)
Boston & Maine.	Northeastern (S. C.)
Boston & Providence.	Ogdensburg & L. Champ.
Boston, Barre & Gardner.	Old Colony.
Camden & Atlantic.	Pennsylvania.
Catasauqua & Fogelsville.	Pennsylvania Co.
Central, of N. J.	Pennsylvania & N. Y.
Central Vermont.	Pitts., Cincinnati & St. L.
Cheshire.	Phila. & Reading.
Conn. & Passumpic Rivers.	Phila., Wil. & Baltimore.
Conn. River.	Portland & Ogdensburg.
Concord.	Providence & Worcester.
Concord & Claremont.	Prov., Warren & Bristol.
Danbury & Norwalk.	Petersburg.
Del. & Hudson Canal.	Raleigh & Gaston.
Eastern.	Richmond, Fred. & Potomac.
Fitchburg.	Richmond & Petersburg.
Housatonic.	Richmond & Allegheny.
Hartford & Conn. Western.	Rome, Watert'n & Ogdensb'g.
Lehigh Valley.	Seaboard & Roanoke.
Long Island.	Sullivan County.
Manchester & Lawrence.	Troy & Boston.
Maine Central.	Vermont Valley.
Naugatuck.	West Jersey.
N. Y. Central & Hud. River.	Wilmington, Col. & Aug.
N. Y., N. Haven & Hartford.	Wilmington & Weldon.
N. Y., Prov. & Boston.	Worcester & Nashua.

A total of 62 companies, operating 18,446 miles of road. The Pittsburgh and the Richmond & Allegheny joined the Association during the year.

The report of the Executive Committee sets forth the advantages secured by the Association to its members, and alludes briefly to what has been already gained in protection against unjust claims and exorbitant damages for infringement of patents.

The receipts and expenditures during the year were as follows:

Assessment No. 15	$17,618.96
Costs, back collections, etc	1,234.42
Entrance fees	775.60
Interest on investments	1,971.35
Total receipts	$21,599.73
Disbursements	17,324.20
Surplus for the year	4,275.53
Balance, Jan. 1, 1881	43,354.16
Balance, Jan. 1, 1882	$47,629.69

Of this balance the sum of $13,974.69 is in cash, and the balance of $33,655 is invested in interest-bearing securities.

It is recommended that the assessment for 1882 be 50 cents per mile of road and $50 upon each $1,000,000 of gross receipts of all lines operated by each member of the association.

The report says: "There has been some discussion as to the desirability of our acquiring the powers of a corporation. Your Committee has not so far discovered any necessity for making such a radical change in the organization of the Association.

"We have been asked to extend still further the duties of the Association, by examining the *title* to all patents submitted for examination, and to pass opinions on the *legal construction* of written instruments conveying title to letters patent, which have been heretofore accepted by railroad managers.

"After mature consideration we have decided that as these papers are necessarily drawn by the legal advisers of the companies, we cannot accept this responsibility; but have instructed our General Counsel to give the members any *recorded* information he may have respecting the ownership of letters patent, when so requested, and in this respect we would call attention to the general form of such instruments he has given us in his report, and recommend the adoption of the same by the members when they purchase the right to use any patented invention."

The report of Mr. Andrew McCallum, the Secretary and General Counsel, states that the Petersburg and the Richmond & Allegheny companies joined during the year. The entrance-fee was last year established at $2.50 per mile of road worked; this may be changed for the present year.

Mr. McCallum's report gives the following statements of the business of his office for the year:

INQUIRIES AND REPORTS ON PATENTS.

"On referring to the list of patents examined and reported on during the year, it will be found that the inquiries embrace a very wide range of subjects, the patents examined not being confined solely to improvements on road and rolling stock, but covering improvements in other arts of general application, which would seem at the first glance to have no relation to railroads. For instance, ship's davits, watchmen's time-detectors, chimney cowls, sand-blast engraving, link-welding machines, lighting by electricity, etc.

"But when it is known that some railroad companies require the use of steamboats to complete their connections, it will be seen that a ship's davit is as much the subject of legitimate inquiry as a car brake; and when we learn that the sand-blast is used as a means for sharpening files, and know that files are used in every railroad shop, the connection becomes apparent.

"I call attention to these reports to illustrate the fact that the business of the Association extends over a very large field, and one which from year to year increases so as to embrace arts which formerly had no connection with the operation of railroads.

"All the information collected respecting the various subjects of inquiry is preserved in the reports which constitute our records, and as they have been gradually accumulating for 15 years, it will be readily understood what a vast amount of valuable information is stored up and made available for the benefit of the members.

"A large proportion of the inquiries made during the past year have been answered from information previously acquired, so that the appended list of patents examined does not fully show the business of the Association in this respect. It only shows what patents have been examined for the first time, with a view to determine their validity, or whether claims made for their alleged infringement were good or bad.

"To give an idea of what some of the claims submitted would amount to, if the demands made upon our members were acceded to, I select a few cases before your Executive Committee, viz.:

"A claim that the ordinary method of attaching wheels to car axles by pressure, and which has been in use for a long period of years by almost every railroad in the country, infringes certain letters patent now in force.

"A claim that the use of any description of refrigerator car is an infringement of certain letters patent.

"A claim that the common method of operating the cylinder cocks of locomotives by means of a sliding cam rod infringes certain letters patent.

"A claim that the method of detaching the wheels and axles from the truck so that they can be rolled out without taking the frame-work apart, is covered by letters patent still in force.

"A claim that the use of a paper tag, strung on the strap of an ordinary baggage check to show destination, is an infringement of certain letters patent.

"A claim that the exhaust ventilator as applied to the elevated roofs of passenger cars, infringes certain letters patent.

"Which few cases will serve to illustrate the fact: *that most of the claims made against our members are for devices in general use by all railroads*, and that the benefits of the Association received by one are shared by all its members, though some of them may not have any claims made directly against *them*, or *be aware* that the use of a particular device is claimed to infringe any letters patent.

"As a rule, nearly all such claims are of a fraudulent nature, made long after the dates of the patents upon which they are based, and when the evidence of their invalidity is supposed to have been lost by the death or dispersion of parties who knew the facts and history of the art; so that it is only by patient and careful investigation and by free communication with the old employés of our members that the necessary facts to defeat such fraudulent claims can be obtained.

CONGRESSIONAL.

"It was not found necessary to take any action with respect to private bills for the extension of letters patent during the second session of the Forty-sixth Congress, as the subject had been fully discussed before the Senate and House Committees on Patents during its first session, and the opinion prevailed that no extension of a 17-year patent should be allowed, except in extraordinary cases, and all patents now in force were granted for seventeen years.

"As the committees for the Forty-seventh Congress had not been appointed at the termination of the year 1881, of course no action could be had, but the bills introduced during the present session will receive proper attention.

"Some of our members have expressed a desire that the Association should take an active part in promoting legislation with a view to the amendment of the patent laws, which are acknowledged to be defective in several respects, particularly as to the sections providing for the surrender and reissue of letters patent, limitation as to time within which suits for infringement may be commenced, the recording of licenses, and the lack of any provision for testing the validity of a patent by the public, or by a private individual interested in the subject of the patent.

"Your Committee, after fully discussing the subject, adopted the following resolution:

"'*Resolved*, That it is not thought advisable for the Association to introduce, or, as an Association, advocate legislation in Congress, but the members should promote any bill that may be offered to amend the patent laws, so as to require the patentee or owner of a patent to give notice of any claim for infringement, and to commence suit thereon within a reasonable time after such notice is given.'

"Bills providing for such amendments of the patent laws have been before Congress for several years, and it is hoped that the subject will receive proper attention.

"It is a matter in which the public at large is interested, and the promotion of which should not be confined to any particular interest or class in the community.

"Possibly the required legislation may not be had until the necessity for it becomes apparent from the decisions of the United States courts.

"On the question of reissued letters patent, and the effect of long delay in commencing suit for infringement, the United States Supreme Court, by its decisions, has very clearly indicated that the law as it now exists is imperfect, and liable to be grossly abused.

"The recurrence of such attempted abuses the Court may not be able to prevent, but it appears determined to give them no sanction or encouragement.

"In view of which fact I am satisfied that a remedy will be provided without requiring the advocacy of any particular class whose promotion of the proposed legislation might be wrongly construed as an attempt at special legislation.

LEGAL.

"As before intimated, the law business of the Association during the past year has been of great importance, and it is with much satisfaction that I am able to report that its efforts to protect its members against unjust and fraudulent claims have been supported and sustained in a remarkable degree by the decisions of the United States Courts.

"The new suits commenced against our members during the year, and the defense of which has been assumed by the Association, are as follows:

David Matthew *vs.* Pennsylvania R. R. Co.
The National Car Brake Shoe Co. *vs.* Boston & Maine R. R.
" " " " Old Colony R. R. Co.
" " " " Boston & Albany R. R. Co.
William Tracy *vs.* Pennsylvania Company.
Edwin R. Bennet *vs.* Baltimore & Ohio R. R. Co.
George G. Hunt *vs.* Pittsburgh, Fort Wayne & Chicago R. R. Co.

"The first of these cases, Matthew *vs.* Pennsylvania R. R. Co., was brought for alleged infringement of Patent No. 22,439, granted to David Matthew, Dec. 28, 1858, for an improvement in locomotive axle bearings. Our records show that the patent was examined and declared invalid by your Executive Committee, May 8, 1867.

"It appeared, however, that previous to that time the Pennsylvania Railroad Company had been sued for infringement and had effected a settlement for this and other patents owned by Matthew, Sept. 12, 1861, and had taken a license which was supposed to cover all future use of the invention by the Pennsylvania Railroad Co.

"The claim was based upon the alleged fact that the license did not cover the right to use the invention within the state of New Jersey, the Pennsylvania Railroad Company not operating any roads in that state when it was given.

"Counsel believed that the license was sufficient, and issue was joined upon this question without requiring to go into the question of the validity of the patent.

"The matter was first argued before his Honor Judge Butler, District Judge for the Eastern District of Pennsylvania, and again before both Justices McKennan and Butler of said Court, the result being a final decree dismissing the bill of complaint, with costs to defendant.

"I give the particulars of this case for the reason that it shows that the defense of a case may sometimes turn upon a question of title, irrespective of any defense on the question of validity of letters patent.

"The suits of the National Car Brake Shoe Co. are brought for alleged infringement of Patent No. 45,106, granted to Joseph Wood, Nov. 15, 1864, for improvement in car brake shoes.

"The suit Tracy *vs.* Pennsylvania Company is brought for alleged infringement of Patent No. 62,510, granted to William Tracy, Jan. 6, 1867, for improvement in railroad switches.

"The suit Bennet *vs.* Baltimore & Ohio Railroad Co. is brought for alleged infringement of a patent originally granted to Joseph Wood, Dec. 24, 1861, for improvement in railroad frogs, and reissued July 1, 1873, No. 5,473.

"The suit Hunt *vs.* Pittsburgh, Ft. Wayne & Chicago Railroad Co. is brought for alleged infringement of letters patent No. 45,609, granted to George G. Hunt, Dec. 27, 1864, for improvement in car trucks.

"It is believed we have a perfect defense to all the new suits above referred to.

"With regard to the old cases, I have to report that several have reached a successful termination.

"In the United States Supreme Court the case of Edward Mellon and William Matthews *vs.* the Lehigh Valley Railroad Co., was argued and decided in our favor.

"The claim for infringement was based upon letters patent No. 58,447, granted to Edward Mellon, Oct. 2, 1866, for improvement in the mode of attaching tires to the wheels of locomotives, and the patent purported to cover all steel tires put on the wheel centres with a flange to prevent lateral movement of the tires.

"In the Circuit Court the decision was against us. The patent was declared to be valid and to be infringed by the defendant.

"The decision of the United States Supreme Court reverses the decision of the Circuit Court, and orders the suit to be dismissed, with costs to defendant.

"The suit brought by the Hien Car Coupling Co., in the Eastern District of Pennsylvania, for alleged infringement of the Van Hoesen & Brown patent for car couplers, by use of what is known as the Janney car coupler, was dismissed, with costs to defendant; but the patent has been again reissued, and it is believed to be the intention of its owners to commence a new suit upon the last reissue of the Van Hoesen & Brown patent.

"The suit G. S. Appleton *vs.* the Rutland Railroad Co., which was brought for alleged infringement of letters patent No. 22,844, granted to G. S. Appleton, Feb. 8, 1859, for improvement in switches, has also been terminated in favor of the defendant. It will be remembered that claims under this patent were made against a very large number of our members, and that all the members were cautioned against making any settlement of the same. The litigation respecting it is now at an end.

"The suit brought by Willard H. Smith against the Long Island Railroad Co. for infringement of his patents for lamps and burners has also been dismissed, and no further litigation under these patents is anticipated.

"The cases of Joseph Trimble *et al vs.* The Central Railroad Co. of New Jersey, the Boston & Albany, and the Lehigh Coal & Navigation Co. for alleged infringement of letters patent No. 18,882, granted to N. Demary, Jr., for an improvement in snow-plows, Dec. 15, 1857, may also be said to be determined by a decision against the validity of the patent in a suit brought against the Union Pacific Co., in the argument of which your General Counsel was called upon to take part.

"The patent purported to cover all snow-plows, for use in deep snow, in which an inclined plane is employed to elevate the snow and a double-sided mold-board is used to discharge it clear of the track.

PENDING LITIGATION.

"With regard to pending litigation I have to report that the suit brought by Johnson & Sandford against the Flushing & Northside Railroad Co., now pending in the United States Supreme Court, is ready for argument, and will most likely be reached in the month of March, 1882.

"This suit is brought for alleged infringement of a patent originally granted May 19, 1857, to Johnson, Higbie & Link for an improved mode of fastening sheet metal on roofs, and reissued to Johnson & Sandford April 16, 1872, so as to make the patent cover the fish-bar rail joint, in almost universal use on the railroads of this country.

"Of the Sayles cases, for infringement of the Tanner brake patent, which abated by reason of the death of the complainant, only five have yet been revived, to wit:

Charles T. Root, Executor, *vs.* Jefferson, Madison & Indianapolis R. R. Co.,
Charles T. Root, Executor, *vs.* Indianapolis & Vincennes R. R. Co.
Charles T. Root, Executor, *vs.* Wilmington & Weldon R. R. Co.
Charles T. Root, Executor, *vs.* Raleigh & Gaston R. R. Co.
" " " Rutland R. R. Co.

"The case of Sayles *vs.* Richmond, Fredericksburg & Potomac Railroad Co., now pending in the United States Supreme Court, may be reached during this term; but it is believed that the questions of law involved may be decided before it is reached, as the same points were argued in a case against the Lake Shore & Michigan Southern Railroad Co., and are now under advisement by the Court.

"The decision will either terminate the litigation or prolong it for a further indefinite period.

"The cases of Emigh & Stevens against the Baltimore & Ohio Railroad Co. came up in the Circuit Court on the master's report, which awarded damages to the amount of $176,005. The question was simply one of damages, and after argument, which took place in February, 1881, the Court reduced the amount to $85,400, the efforts of the Association thereby effecting a saving of $90,605.

"The cases have since been appealed to the United States Supreme Court.

"The other cases pending on this Stevens patent are involved by questions of title, and the effect of licenses held by the defendant companies—questions which your committee held to be distinct from the ordinary business of the Association.

"The case of Turrill against the Fitchburg Railroad Co. for infringement of the Cawood swage-block patent for mending rails, pending in the District of Massachusetts, will probably be reached at an early day.

"The patent has been several times sustained by the United States Supreme Court; but this case comes up on evidence which was not before that Court.

"The case of Williams and Albright against the Pennsylvania Railroad Co. for alleged infringement of patent No. 38,765, granted to S. J. Seely, June 2, 1863, for oil cars, is virtually determined by a decision against the validity of the patent in another suit. The suit will be dismissed in due season.

"There are a number of other suits, some of long standing, which may be considered abandoned.

"The only litigation of any importance may be said to be embraced in the claims of Johnson and Sandford for fish-bar rail joint; the Tanner brake; the locomotive swing-truck; the Stevens brake; the Cawood swage-block; the Griggs brick arch for locomotive furnaces; and the new cases first referred to.

SETTLEMENT OF VALID CLAIMS.

"Though we have not been called upon to make settlement involving a money consideration, we have been able

to make special arrangements with certain patentees and owners of valid patents, by means of which the members may acquire the right to use the inventions on exceptionally favorable terms, at the same time securing a release from all claims for past infringement.

"Such an agreement was made with Mr. J. E. Buerk, of Boston, the patentee of certain improvements in watchman's clocks and detectors, and also with Mr. De Lancy Kennedy, of New York city, the patentee of certain letters patent covering what is known as Kennedy's spiral punch.

"Other offers of similar arrangements have been received; but were declined for the reason that the validity of the patents offered had not been sustained by decisions of the courts or your Committee, and the subject matter was not considered of sufficient importance to receive the indorsement of the Association.

ASSIGNMENTS AND LICENSES UNDER LETTERS PATENT.

"The question was raised, whether the Association should give opinions upon questions of title to letters patent, and the legal construction of written instruments conveying the right to use patented inventions, it not having been the practice of your committee to take cognizance of, or pass upon such legal questions.

"A discussion of the question resulted in the adoption of the following resolution:

"'*Resolved*, That this Association will, through its General Counsel, furnish to any of its members, any information it may be able to give in relation to the legal construction, effect and bearing of any license or assignment made by the inventor or owner of any patent to one of the members; but inasmuch as such licenses and assignments have been drawn or accepted by the officers or counsel of such members, without action by, or consultation with the Association, the Association cannot properly take charge of, or assume the expense of any litigation growing out of, or connected with such licenses or assignments.'

"The question of title to letters patent is one of very great importance, but unfortunately it is one, the determination which is beset with great difficulty, owing to several causes, the chief of which is the unsatisfactory condition of the law on the subject.

"The statute does not specially provide for what is commonly known as a license, and though the practice of granting licenses under letters patent is the most ordinary means employed for conveying the right to use a patented invention, there is no statutory provision requiring that such an instrument shall be recorded anywhere.

"The law provides (Section 4,898) that every patent or any interest therein shall be assignable in law by an instrument in writing; and the patentee or his assigns, or legal representatives may, in like manner, grant and convey an exclusive right under his patent to the whole or any specified part of the United States. An assignment, grant or conveyance shall be void as against any subsequent purchaser or mortgagee for a valuable consideration without notice, unless it is recorded in the Patent Office within three months from the date thereof.

"Under this law it would seem to be clear, that any instrument conveying an exclusive right to a patent to be good against any subsequent purchaser, must be recorded in the Patent Office, and in view of the fact that an ordinary license conveys no exclusive right, and therefore does not come within the statute, I respectfully suggest that hereafter when a railroad company purchases the right to use a patented invention, it should take an assignment and not a mere license, and have such assignment recorded in the United States Patent Office.

"It should also make sure that the assignment covers the right to use the invention on all the lines now or hereafter owned, leased or operated by it within the United States and territories thereof.

"The instrument should also contain a release from all claims for past infringement, and all claims which may arise through the use on its road of cars or other rolling stock belonging to other companies, or from the use of its cars and rolling stock on other roads. * * * * * *

(A form for such a deed is included in the report.)

EXPENDITURES.

"On referring to the Treasurer's report, showing the items of expenditure and comparing the same with the report for 1880, it will be found that some of the items are larger and others less, but that the actual running expenses have been about the same as for the previous year.

"With regard to legal expenses of a general nature there has been considerable reduction, but the expenditures on account of special litigation show a considerable increase, amounting to $4,059.54 as against $2,080.54.

"With the exception of $324 this expenditure has been incurred on account of suits of long standing in the courts.

"In view of the increase of legal business and the necessity for employing attorneys skilled in the practice of the patent laws, I cannot promise any material reduction for the future, and I think it proper to say that the expenditures on this account for 1882 may be greater than for the past year, owing to the fact that some of the most important cases pending in the United States Supreme Court will probably be determined during the year."

In conclusion the report gives a list of 73 patents examined and reported upon during the year, including a great variety of subjects. Inquiry and report were also made upon the following general subjects, not included in the list of patents: Brake shoes, baggage checks, car axle-box lids, car couplings, discharging water into the steam-spaces of boilers, steam reversing gear, valve-stem and piston-rod packing and watchman's time-detectors.

Automatic Air vs. Automatic Vacuum Brakes.

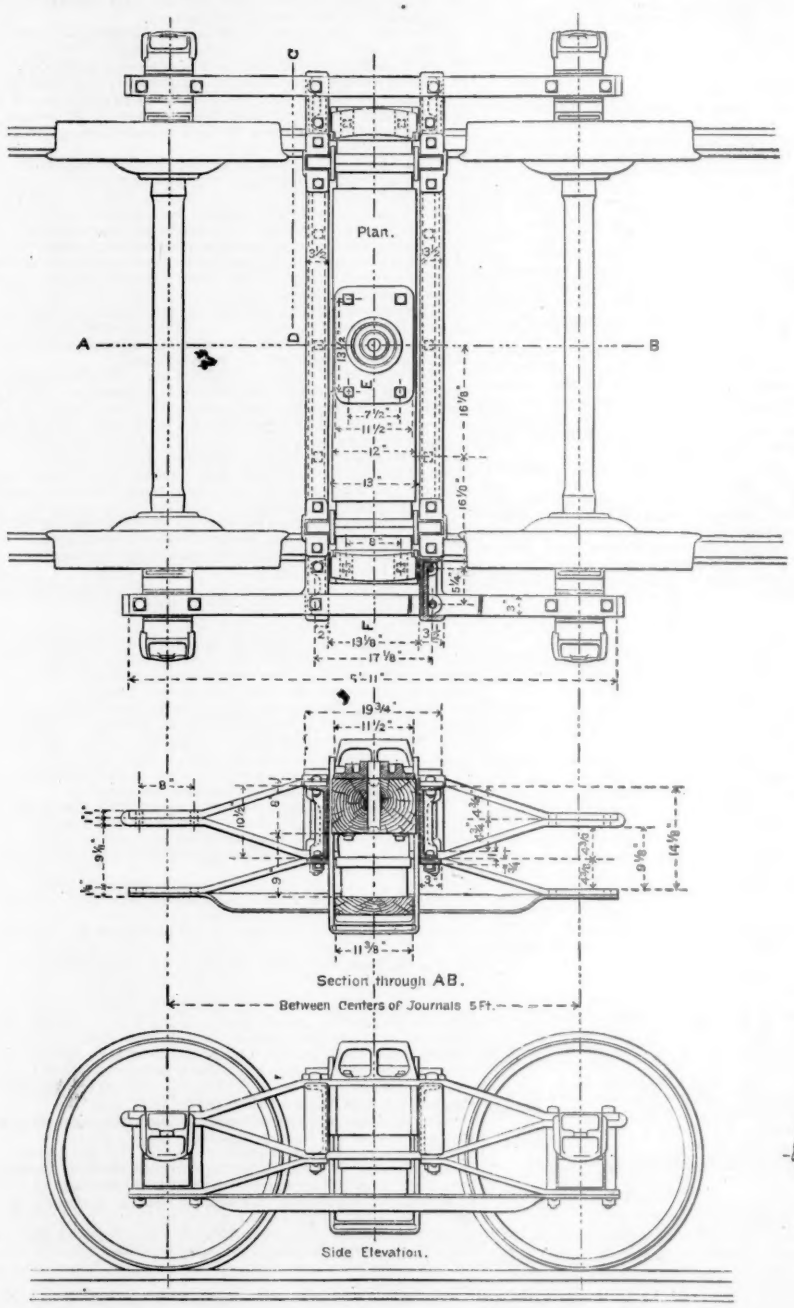
A correspondent of the *English Mechanic*, Mr. Clement E. Stretton, contributes the following interesting letter on the "brake question," which is still exciting an immense amount of discussion in Europe:

It has already been mentioned that the battle of the brakes is now being fought upon the question of which automatic brake shall be adopted, air or vacuum.

Before proceeding to express an opinion upon either of these systems, it will be of advantage to correct an idea, somewhat generally held, that an automatic brake cannot be made to work without valves; it should be clearly understood that it is perfectly easy to construct such brakes to work with air-pressure or vacuum, without any taps, valves, or other so-called complicated parts; but all such brakes have and must have the fatal defect of being slow in action. After any brake trials or experiments have been conducted, the question is frequently asked. "Why is it that the Westinghouse automatic brake always proves itself to be the best?" The reason is that its action is as nearly as possible instantaneous, the retarding power therefore is brought into effect with the least loss of time and distance; and this very great advantage is due to the use of the triple valve and high pressure. Mr. J. E. Harrison, the Engineer-in-Chief of the Northeastern Railway, in his report to the directors of that company, mentioned that the triple-valve had been made a regular bug-bear by the opponents of the system, but he considered it a model of ingenuity and simplicity. The triple-valve is nothing more than a piston and slide-valve moving together as one piece. It is fixed between the auxiliary reservoir, which is charged with compressed air, and the brake cylinder; when the piston is pushed *up* the communication between the reservoir and cylinder is closed and the brake is "*off*;" when, in consequence of the pressure in the main brake-pipe being reduced, the piston moves *down*, a direct passage is instantly opened, through which the air rushes from the reservoir to the cylinder, and applies the brake in a moment. This useful triple-valve has been called "complicated," but it will be seen that its action and construction are most simple. The next question which must naturally arise is, "If an automatic vacuum brake were constructed with a triple-valve, would the results obtained be equal to those of the Westinghouse automatic air brake?"

Most certainly they would not. A triple-valve would very greatly improve the action of a vacuum brake, but it is perfectly well understood that any amount of improvements in details can never make a bad system into a good one, nor overcome difficulties caused by the principal being wrong from the commencement.

In a letter which appeared in the *English Mechanic*, June, 1878, and in my pamphlet on "Railway Accidents,"

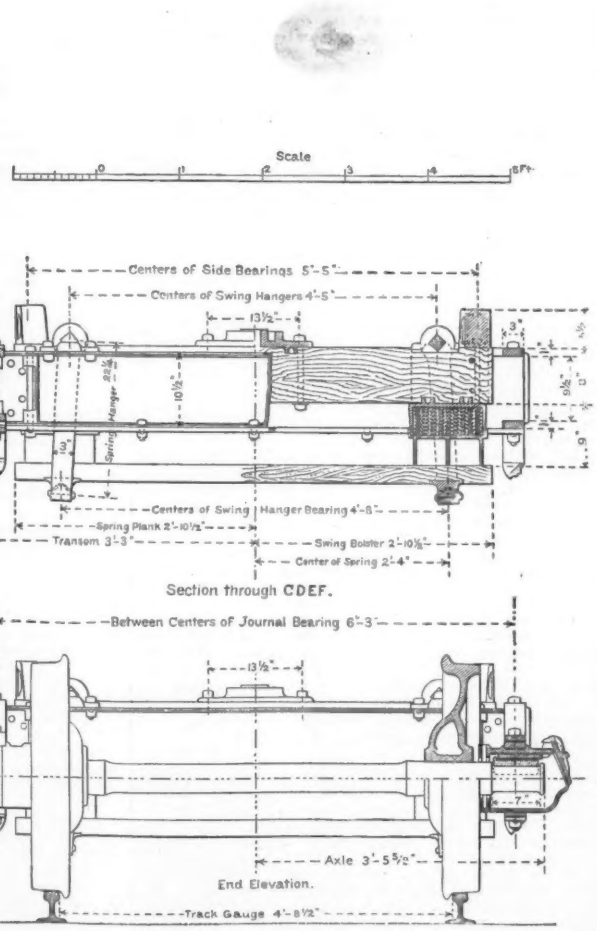


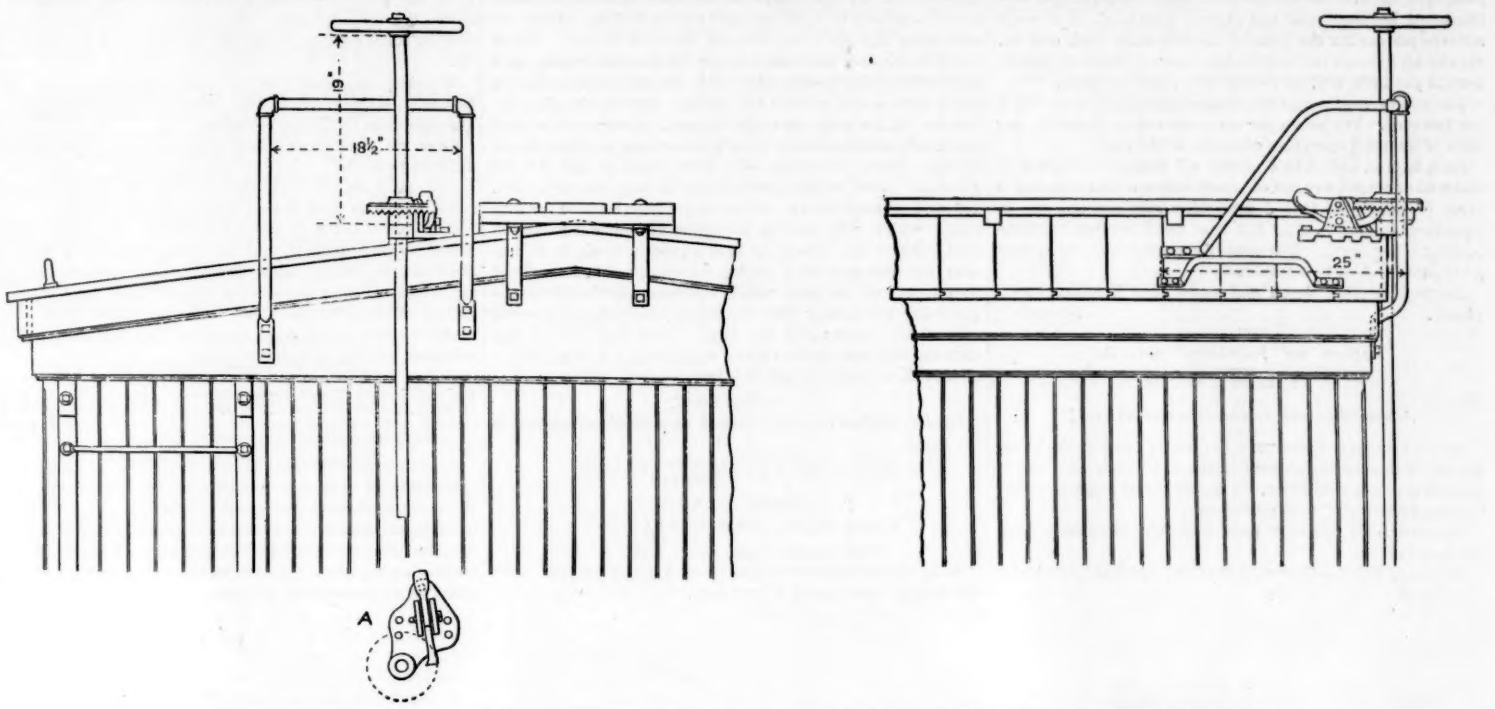
STANDARD TRUCK FOR FREIGHT-CARS

OF NEW YORK CENTRAL & HUDSON RIVER RAILROAD

and its Connecting Lines.

Leander Garey, Superintendent of Car Department.





ARRANGEMENT OF BRAKE-WHEEL, SHAFT, ETC., FOR BOX CARS OF NEW YORK CENTRAL RAILROAD.

February, 1881, I dealt fully with this question, and pointed out that the vacuum principle had the inherent defect of having only the pressure of the atmosphere to work with, whereas the compressed air system could be applied with any desired power.

The Westinghouse automatic brake is generally worked with a pressure of 70 or 80 lbs. per square inch; this permits the pipes, cylinders and other parts to be of small dimensions. On the other hand, a perfect vacuum gives a pressure of 15 lbs. per square inch, but practically, a partial vacuum of 12 lbs. is all that can be obtained to work the brakes.

To make the low pressure of 12 lbs. exert the necessary power, the areas of the cylinders must be made fully six times as large to perform the same work as the high pressure of 70 or 80 lbs. There is no difficulty in *constructing* vacuum cylinders or sacks of the required size; but the very important point is, that every increase of size of course increases the cubical contents of the apparatus, and consequently a greater quantity of air has to be moved to apply and release the brakes; hence slow action *must* follow.

An automatic vacuum brake (as used on the Midland Railway, for instance,) is of such a large size to obtain the required power, that no less than 2,600 cubic inches of air must enter the pipes and cylinders upon *each carriage* in order to apply the brake with full power; therefore, in a train of 16 carriages, 41,600 cubic inches of air must pass into the apparatus, at the low atmospheric pressure, and it is stated that in practice this will occupy nearly *ten* seconds.

In the Westinghouse automatic brake it is not necessary that the pressure in the brake-pipe should be destroyed, but only that it should be reduced 20 per cent. Here, again, we see the great advantage of the triple-valve; instead of having to discharge *all* the air from the brake-pipe, it is only necessary that the pressure should be reduced enough to cause the pistons in the triple-valves to move down, and thus open direct communication between the auxiliary reservoirs and the brake cylinders, which instantly applies the brake with full force. In the Westinghouse system the space in the pipe and lower part of triple-valve upon each carriage is about 330 cubic inches (and as only 20 per cent. reduction is required to put the brake *full on*), it follows that only 66 cubic inches of air per carriage have to be discharged, or upon a train of 16 vehicles 1,056 cubic inches.

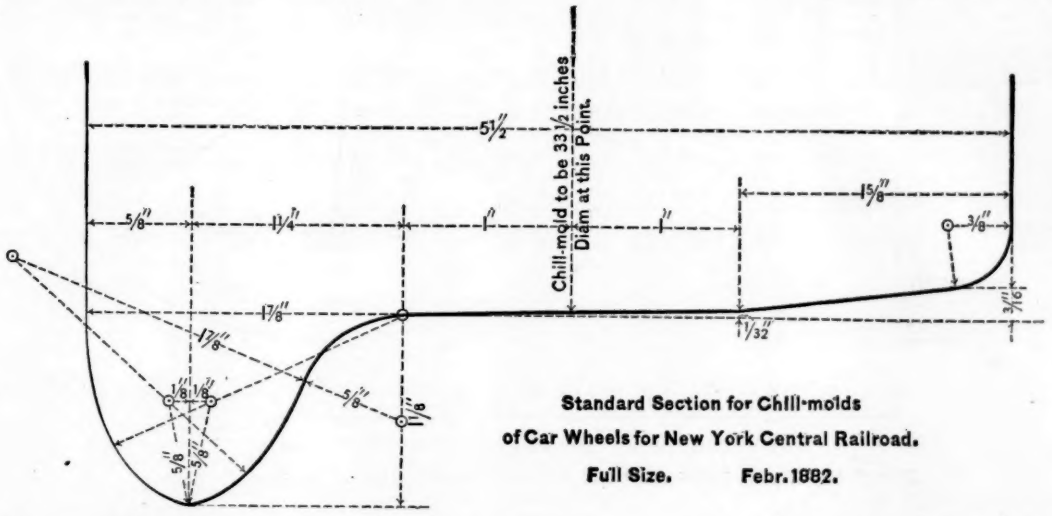
Having before us these details, it is easy to draw up the following summary:

Upon a train of 16 carriages, an automatic vacuum brake (having no triple valves) requires 41,600 cubic inches of air to be moved at a low pressure, which takes about ten seconds, whereas the Westinghouse automatic brake only requires 1,056 inches of air to be discharged at high pressure, which practically takes about 1¼ seconds.

In this short summary we have, in a few words, the principle of the two systems clearly illustrated, and we can now give an answer to the question "why the Westinghouse brake has always proved itself to be the best:" Instantaneous action, produced by the use of high pressure, controlled by that most ingenious piece of mechanism, the triple valve.

New York Central Standard Freight-Car Truck.

The engravings this week represent the standard truck, the arrangement of brake-wheel, shaft, etc., of the standard freight cars adopted by the New York Central and its connecting lines; also a full-size section showing the standard shape and dimensions for the chill molds in which the tread and flanges of the wheels are cast, and to which these railroads will require all wheels to be made hereafter. The truck illustrated is used for all freight cars of these lines. Engravings of the cattle cars and gondola or platform cars will be published hereafter.



Standard Section for Chill-molds of Car Wheels for New York Central Railroad.

Full Size. Febr. 1882.

Contributions.

Details in Operating Accounts.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The communication signed "Advancement," in your issue of May 5, contains many valuable suggestions worthy the attention of railroad managers, and not the least so is that which advocates more detail in expense accounts.

What private business of magnitude equal to that of the least of our railroads would be conducted with so little attention to detail?

What private business would allow property to such an extent as is customary with railroads to be lying about or in the hands of so many people without any adequate record of its existence, or check upon its use or misuse?

There are of course exceptions in this matter, but they serve only to prove the rule.

As an instance, I would cite the custom which so largely prevails of charging station supplies to an account called "Repairs of Buildings."

A lamp chimney breaks or a broom wears out, and the articles issued to replace them are charged to this account. Are the *buildings* any better for such repairs?

The objection to this method is, chiefly, that the property is lost sight of, and is therefore subject to abuse and theft.

How many roads keep an account with each station of the supplies furnished it, and hold the station master strictly accountable for their misuse? It is not merely station supplies, but hundreds of other articles, which, upon being charged to expenses, disappear from official view, and on far too many roads are issued without proper check as to their use or abuse.

Careful supervision of issues and detailed accounts by which employés can be held to a strict accountability for use of property are the only remedy for this evil; but the moment such a scheme is suggested the bugbear of expense is raised, and the almost universal verdict, "We cannot afford it," is quickly reached.

Doubtless there is a detail which does not pay; but the tendency is in the opposite direction, and it is a pretty safe rule that property which is worth having is worth looking after.

There are hundreds, and probably thousands, of miles of railroad in this country on which no correct account is kept of materials in stock, and the expenses are made up by charging bills directly to expense account on some one's opinion as to where the articles are to be used.

Still more, there are railroads which charge bills to expenses directly on the cash book, making no entry of bills until paid; consequently, if money is scarce, the unpaid bills appear neither as expenses nor as liabilities, and the balance sheet fails to represent the condition of the company's affairs.

But I am digressing; my intention was to suggest the propriety of sub-dividing expense accounts more closely, and in the matter of car repairs to recommend the following heads, viz.:

Account: "Repairs of Passenger, Baggage and Mail Cars."

Sub-accounts: 1. Wheels and Axles.
2. Painting and Varnishing.
3. Stoves, Heaters and Lamps.
4. Seats and Upholstering.
5. General Repairs.

Account: "Repairs of Freight Cars."

Sub-accounts: 1. Wheels and Axles.
2. Draw-bars, Pins and Coupling Links.
3. General Repairs of Local Cars.
4. Repairs of Foreign Cars (to cover all repairs of foreign cars).

I believe the above heads to cover the chief items of expense, and to be so arranged that a manager can tell what is being done and what it costs.

I have tried the plan suggested by "Advancement" at keeping individual accounts with passenger cars of repairs, and of course of mileage, but am convinced that better results can be obtained by treating the passenger equipment as a whole, than by taking special cases.

For example, on a New England road having a large local

passenger business, during the past year, 205 passenger cars (including baggage, mail and express cars) made an average mileage per car for the year of 25,832 miles and cost for repairs an average per car for the year of $243.25, which, per car per mile, is 0.9417 cent—not quite 9½ mills.

The cost of replacing four condemned cars by new ones is not included. The passenger car repairs were about 2½ per cent. of the total operating expenses of the road.

Such figures, and in fact nearly all figures in regard to railroad expenses, are not of great value unless covering a term of years, so that depreciation and renewal can be equalized in the results, but that need not deter us from making a beginning. The years fly quickly by, and as they go should teach us by experience.

Let us have more detail and more light in regard to expenses.

SYSTEM.

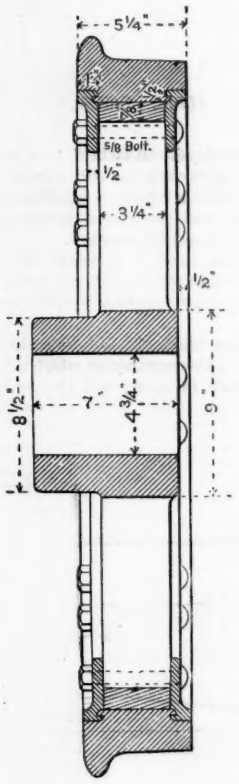
Papers on Painting.*—No. 3.

BY CHARLES L. CONDIT.

As it is necessary to use very frequently some of the terms defined in the first installment of these articles, but which readers may not remember, we repeat below a part of the "Little Dictionary" then published :

Glycerine.—To be had of your druggist. It is made from oils and fats.

Glycerine Ether.—Glycerine as it exists in oils, united with an oil acid.



WROUGHT-IRON CAR WHEEL, WITH STEEL TIRE.

Manufactured by the Patent Shaft and Axle-tree Company, Limited, Wednesbury, England.

Oil Acid.—An acid which when linked with glycerine ether is known as an oil.

Oil.—An oil acid linked with glycerine ether, and from which glycerine and soap can be made.

Soap.—An oil acid linked with soda, potash, lead, zinc, iron or some such substance. Some soaps do not dissolve in water.

Free Oil Acid.—An oil acid unlinked from glycerine ether, but not united with another substance.

Flying Oil Acid.—An oil acid which becomes lighter than air (due to action of heat or light) and flies away as would a gas.

OLD OIL AND FATTY OIL.

Some old oils dry much faster than new oils, as the following experiment by the great French chemist Chevreul will show:

TABLE NO. 6.

When spread.	Oil kept 44 days in a closed bottle.	Oil kept 44 days in a bottle with some air.	Oil exposed 44 days to free air.
1st coat dried in.....	.....11 days.	9 days.	4 days.
2d " "	8 "	8 "	5 "
3d " "	6 "	6 "	4 "
The three coats dried in...	25 days.	23 days.	13 days.

It is well known that other old oils seem to have lost the property of drying; they become thick and "fatty" but do not dry. The well-known English artist Holman Hunt was once advised to paint with fatty oil in order to prevent cracking, and he says that picture is not dry yet. Where is this difference in oils? We know the tendency of change in long-kept oil exposed to light and air is the unlinking of the oil acid from the glycerine, leaving the oil acid free. This is the change which takes place when oils become raucid, and also in oils which become dry. It is, therefore, important to know what would occur if this change should take place before the oil has taken up much oxygen, in other words what an oil acid unlinked from the glycerine ether would do about drying. There are those who have reasoned that it is the glycerine ether which prevents the oil from becoming dry. One and perhaps several patents have been secured for processes which will unlink the glycerine ether from the oil acid. What the effect of such a process would be will be seen by the following tables, which give the increase of weight of an oil acid which had been unlinked from the glycerine by adding lead to the oil, and so making a lead soap of the oil acid and the lead. From this oil-acid-lead soap the acid was washed away with ether, the ether driven off and the oil acid, at last, left free.

TABLE NO. 7.

Drying of Free Oil Acid spread on a Surface exposed to the Light :

Gain in weight in 3 days nearly 8 per cent.
" " " " 7 " about 18 "

EXPERIMENT NO. 2.

Gain in weight in 3 days about 8 per cent.
" " " " 7 " 14 "
Total gain after many days...17½ "

Oil in drying gains in weight from 8 to 12 per cent.; but this free oil acid gained 17 per cent.

Nevertheless, it was not dry, but sticky, "tachy," somewhat like pitch in character, not in color. It did not become dry for many months after this gain in weight. Mulder, therefore, properly says that linseed oil acid unlinked from the glycerine ether requires as many months as linseed oil requires days to dry.

There are, in fact, two ways in which oil may dry.

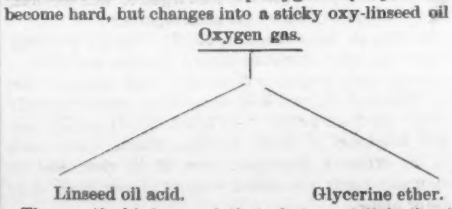
1st. It may dry directly into a hard but somewhat elastic oil leather.

2d. It may dry by becoming free from glycerine ether, then by taking up oxygen and becoming a sticky, pitch-like oxy-oil acid.

This sticky, tachy acid may finally change into not-sticky oil leather.

Quick-drying Old Oil.—As we have seen, the unlinking of the oil acid from the glycerine ether causes it to dry slowly; nevertheless, good old oil dries more rapidly than fresh oil.

The explanation is very simple: whatever unloosens the oil acid from the glycerine ether causes it to dry faster; whatever unlinks the oil acids from the glycerine ether and sets the oil acid free changes the whole method of drying, so that while the oil acid takes up oxygen rapidly, it does not become hard, but changes into a sticky oxy-linseed oil acid.



The practical inference is that whatever unlinks the oil acid from the glycerine ether is injurious to good drying, if it leaves the oil acid free. The natural impurities in the oil tend in this direction; so also do all acids used to clarify the oil.

Well-kept oil becomes better with every month and even half-year, largely, apparently, because the oil acid becomes loosened from the glycerine ether.

Fresh oil dries slowly, but there appear to be decided differences in oils.*

As to fatty oil, its very slow drying fits it for painting roofs, where an oil is needed which will not dry up.

Oxy-linseed Oil Acid may be white or blood-red. It becomes red on heating it, and the sunlight makes it more or less colorless, because, apparently, it takes up water from the air, which becomes linked with the oil acid, and which is driven off again by the heat. One hundred parts of oil, made red by heating, were spread in the sun and became colorless, gaining in weight 6 parts :

	Parts.
Red oxy-linseed oil acid, by weight.....	100
Water.....	6
Colorless or white oxy-linseed oil acid.....	106

THE NOT-DRYING OIL ACIDS.

Linseed oil contains one-fifth of not-drying oil acids. What is the effect of these upon the oil can only be shown by their effects when in excess in the oil. These are given in some experiments by the French chemist Chevreul, who was interested in the question whether not-drying oil acids could be made useful in painting.

TABLE NO. 6.

Experiments with Oleic Acid and Linseed Oil.

	A.	B.
2 p. m. An oak door was given 1st coat, part A, part B.	Oleic acid. 2 parts. Linseed oil. ..... 1 " Turpentine..... 1 " Drying oil. 0 1-5 " Zinc white.	Pure linseed oil.. 4 parts. Drying oil. 0 4-5 " Turpentine..... 1 " Zinc white.
Jan. 9.	Perfectly dry.	Perfectly dry (2d coat)
" 11.	"	"

It was evident from this and other experiments that there was no difficulty in drying the paint. But Chevreul says: "The two paints present some differences to the eye; the paint with oleic acid being sensibly duller. But its capital defect is a lack of adherence to the wood: the friction of the nail is sufficient to remove it." In a number of other experiments with paints adulterated with oleic acid, there was the same difficulty—the paint remained soft. In only one instance (white lead was used with the oil) was the paint hard and adherent to the wood

These experiments illustrate the influence of the not-drying oil acids; they keep the linseed oil softer. If we would have a hard oil we must harden them; if they entirely disappear the oil will become too hard.

The effect of an adulteration of linseed oil with fish oil is also illustrated; the oil would remain softer, would be more influenced by heat and cold, but would not "dry up." On

* The chemical changes (in oils) now to be studied are less assuredly known. Putting aside the chemical explanation of facts attention will be fixed on certain general aspects of those which have relations with practice. Statements must, therefore, be taken as scientific light upon practical questions; not as absolute certainties without shade of doubt.

* It is not denied that the "foots" in oil injure its drying quality, and may be a cause of difference between old and new oils. It is simply not asserted, for reasons to be given in another article.

tin roofs fish oil is valuable in keeping the linseed oil softer and more flexible, especially under the heat of the sun when the roof expands most. The acids of fish oil tend to rust iron.

The fatty oil acids of the linseed oil partly change into rancid acids and fly away. If the oil contain too much, it is probably more affected by cold; if it contain too little (as when the oil becomes very dry), the oil becomes more brittle. It seems reasonable that a mixture of a small part—one-tenth or one-eighth—of cotton-seed oil should be an advantage for galvanized iron and other smooth hot surfaces. Softness of paint must not be confounded with the elasticity; nothing is less elastic than *cold*, solid fat, while *properly* dried linseed oil contains a true oil-rubber, which, so long as it lasts, gives the oil-leather some of the qualities of india rubber.

Wrought-Iron Car Wheels.

The Boston & Albany Railroad some time ago ordered a considerable number of 33 and 42-in. wrought-iron wheels, of which we give an engraving herewith. These are manufactured by the Patent Shaft and Axle-tree Company, Limited, of Wednesbury, England. The spokes, hub and rim are all wrought iron, and the tires, of course, steel. The latter are secured by retaining rings, as shown in the engraving, to hold the tire on the wheel in case it should break. This or some similar method is almost universally adopted on European roads, and is the result of long experience with the use of steel-tired wheels.

On the Boston & Albany road these wheels are used for passenger cars, tender and engine-truck wheels, and are giving great satisfaction. Their cost, delivered in Boston and including duties, is said to be considerably less than that of some other steel-tired wheels used here. Of the service of the tires no data can be given yet, as they have not been in use long enough. Judging from appearances only, they promise to give very satisfactory mileage. Their appearance is certainly very much in their favor, and there seems to be a very profitable field open to any one who understands the business to begin their manufacture here.

THE SCRAP HEAP.

Train-Wreckers.

The travelers over the Madison Division of the Chicago & Northwestern Railroad may not have been aware of it, but for the past two weeks they have been in constant danger from train-wrecking, and the only wonder is that a serious accident did not happen. It was no fault of the train-wreckers, who seemed to have no other object than malicious mischief, that a terrible accident did not happen. Several times during the period mentioned have ties and rails been found projecting from culverts, and on two occasions freight trains ran into them, but fortunately without serious results. The scene of these operations was about Barrington, in this county, and the perpetrators, two farm-hands named Fred Storm and John Block, are fortunately under arrest.

A week ago last Friday night ties were placed in a culvert, about a mile and a half north of Barrington, near the bottom of the grade from the city, down which the trains came at pretty fair speed, to obtain a momentum up the grade to Woodstock. The ties were put evidently with the intention of wrecking the night express to St. Paul, which passes through that section for twenty miles without a stop and at a big speed. Fortunately, the express with its thirteen coaches was late and a freight was given the track ahead. As the freight ran down the hill, the engineer discovered the obstruction and stopped his train in time to prevent other damage than a shattered pilot. Signals were placed back to warn the passenger, and, after removing the obstructions, traffic was resumed.

The following night, another culvert, about a half mile north of the first was found by a farmer named Joseph Hogan to be filled with ties, which projected upward and were so securely placed and wedged into the culvert that he had to chop the tops off to clear the track. He had just completed the work of clearing away the obstruction when the St. Paul train came booming along.

Last Monday evening a rail, 14 ft. long, was found sticking up from the culvert in which the original obstruction was placed, but Officers C. C. Healy and V. Brown, in the employ of the Northwestern Railroad, were on the lookout, discovered the rail and removed it before any damage was done. While the officers were engaged with it, however, the train-wreckers had gone nearly a mile away and placed a rail across the track. This was struck by an incoming freight train, and again did a pilot and the tender wheels of the locomotive suffer. Greater danger would have resulted but for the care of the engineer, who had been warned of the other attempts. Another attempt was made a few nights ago, but was frustrated by the watchfulness of the officers.

In the meantime the officers were busily engaged in hunting for the guilty parties, being convinced that they lived in the vicinity. The people of Barrington were greatly excited over the attempts, and aided the officers materially in locating the guilt on a young German named Fred Storm, who was employed on a farm north of Barrington, and had been arrested once for setting fire to a slaughter-house. A village youth said he saw Storm place the ties in a culvert, and others had seen him along the tracks on the nights when the obstructions were placed. The arrest was made yesterday morning, but owing to the excitement in Barrington over the affair, threats of lynching being freely uttered, the officer brought his prisoner to Central Station. The prisoner, who is 19 years old, admitted his guilt, and when asked why he placed the obstructions on the tracks, he said he "wanted to see what kind of a tumble the fast train would make into the ditch." He does not appear crazy, but is simply filled with a fiendish spirit of mischief. He said there were others in the thing, and on the strength of his confessions the other farm hand, John Block, was arrested by Officer Brown. Storm will be taken to Woodstock to-day by Officer Healy, and given a preliminary hearing.—*Chicago Inter-Ocean*, May 3.

The New Pennsylvania Dining Cars.

The Chicago *Inter-Ocean* thus describes the new dining cars built for the New York-Chicago limited express of the Pennsylvania Railroad:

"When Mr. Charles W. Adams, of the Pennsylvania Company, announced that his line would surprise the country by placing on the track the finest dining cars yet seen in America, he evidently knew what he was talking about. This he demonstrated Saturday afternoon, when he placed at the disposal of a company of invited railroad, hotel and newspaper men the new cars 'Pennsylvania.' This car deserves the credit of being the most beautiful, comfortable and well-arranged of all the many dining cars that are attached to trains entering or leaving this city at present. The car is 61 ft. 6 in. long, 10 ft. wide, 7 ft. 3 in. high and 9 ft. 3½ in. high in the centre. There are eight tables 3 ft. 4 in. long and 3 ft. 7 in. wide. The dining-room proper is 24 ft. long and 8 ft. 9 in. wide. The ventilators at the top of the car are separated to a greater extent than is usual, thus making the ceiling much wider and the car much lighter and cheerful looking.

"Above the handsome mahogany the clear-story windows are of stained glass. The clear-story is of curl-ash, polished like the surface of a mirror. Four large double silver chandeliers scatter abundant light through the room, reenforced on each side of the car with four tasteful silver sconces that in three branches hold blush-red wax candles. Another feature that attracts attention is the exquisite silver adorned sideboard of carved mahogany, plate glass and dark velvet plush. Opposite this buffet sideboard is a wine closet, while in the rear of the dining-room is the wine closet proper, containing a receptacle for ice, over which are wine racks for 125 bottles. Next to this is a parcel cupboard, and opposite a Baker steam heater, and then a large linen closet.

"There are four of these dining cars, which are painted on the outside a rich, warm brown, bordered with a broad striking pattern in gold, carmine, black, and green highly varnished, inscribed on the side in rich gold letters, 'Pennsylvania' at the top, and 'Dining Car' in the centre of the body, which runs upon two six (paper) wheel trucks. The ornamentation is appropriate to a railroad car; the harmonious colors are massed with effect and detailed with care, and the design is good. Throughout everything is in taste. The wood of the car is everywhere mahogany save overhead and quaintly carved. Where it is possible the partitions are inlaid with handsome, heavy plate glass, made more glittering by beveled edges. The rich Wilton carpet upon the floor is subdued yet strong in color, and woven in unobtrusive pattern. The curtains that run upon silver rods above the windows are of carmine and golden-olive velvet plush, relieved by rich salmon colored cloth, stiff in patterns of gold bullion, veritable cloth of gold. The seats and backs, which are generous and comforting, are upholstered in deep carmine and velvet plush. The seats fold up, as in a theatre, permitting easy ingress and egress, and show on the under side luminous panelings of mahogany.

"These cars were designed by Mr. Theodore N. Ely. Attached to each dining car is another, patterned upon a new model. They contain each a sofa, four large arm-chairs, and four fancy rattan chairs, and some camp-stools permit onlookers to watch the card games played between the permanent seats and on the permanent tables. The car being divided for baggage, the partition forms one wall of this smokers' paradise. Against it are two more most noteworthy improvements, a writing-desk, provided with all necessaries for letter writing, and a library book-case filled with popular books of fiction."

Hard to Kill.

As the passenger train from Willimantic to New London neared the trestle bridge at Norwich Falls the other evening, the engineer discovered a man with a bag on his back hurriedly crossing. The Norwich *Bulletin* says: "Believing it to be impossible for the man to escape injury, the engineer whistled down brakes and did all he could to give the fellow a living chance, but it was of no use, for just as his train reached the bridge the locomotive was enveloped in dust and he was satisfied that a coroner's jury and a dead negro were the next things in order. The train was stopped as soon as possible, the word ran through the train that a man had been killed, and the excited passengers were on the alert to see the remains when the train backed up. One can imagine their surprise when they found a fat and jolly negro heartily laughing beside the track, with at least forty pounds of meal scientifically spread over him. When asked if he was hurt he replied: 'Golly, you bet der is a coon under dis meal, and he is whole.' The train pursued its way."

LOCOMOTIVE RETURNS, JANUARY, 1882.

Master Mechanics of all American railroads are invited to send us their monthly returns for this table.

NAME OF ROAD.	Miles operated	Locomotives in service	MILEAGE. Total	MILEAGE. Average per engine.	MILES RUN TO Ton of coal.	MILES RUN TO Cord of wood.	MILES RUN TO Pint of oil	AVERAGE TRAIN. Passenger cars.	AVERAGE TRAIN. Loaded freight cars.	COST IN CENTS PER Passenger car mile.	COST IN CENTS PER Freight car mile.	COST PER MILE IN CENTS FOR Repairs.	Fuel.	Stores.	Miscellaneous.	Engineers, firemen and wipers.	Total.	AVERAGE COST OF Coal, per ton.	Wood, per cord.
Allegheny Valley, River Div.*	189	43	95,738	2,278	29 45	.....	18.46	3.10	20.4	4.919	1.003	6.25	4.94	0.61	.....	6 59	18.32	$	$
Low Grade Div.*	120	22	47,652	2,166	26.3	.....	14.80	2.50	21.20	4 400	0.901	3.7	4.69	0.70	.....	3 50	15.59	...	....
Buffalo, Pitts. & Western*..	174	22	55,545	2 5 4	30.88	.....	20.12	3.30	12.4	4.600	1.731	5.89	5.85	0.59	.....	5.42	17.76	1.70	2.25
Central Pacific, Western Div.†	200	38	41,783	2,289	47.38	.....	16.67	.....	.....	.....	.....	1.95	18.16	0.54	0.34	6.83	22.82	6.40	4 40
Northern & San Pablo Divs.†	104	29	78,926	2,722	56.61	.....	17 47	.....	.....	.....	.....	7.47	17.50	0.58	0.34	8.14	33.93	6.4	4.40
Visalia Div.†	1 7	1	19,926	2 662	32.22	.....	8.60	.....	.....	.....	.....	2.74	26.58	0.4	0.15	7.56	37.55	6.40	4.40
Tulare Div.†	170	17	45,671	2,651	28.84	.....	17.71	.....	.....	.....	.....	5.89	38.13	0.54	0.38	8.23	53.11	11.25	5.05
Los Angeles, Yuma, San Diego, & Wilm. Divs.†	416	43	127,273	3,192	37.63	.....	14.56	.....	.....	.....	.....	3.34	20.80	0.62	0.26	6.59	49.75	11.25	5.05
Gila Div.†	43	22	7,727	3,21	50.70	.....	17.34	.....	.....	.....	.....	2.83	22.06	0.53	0.39	7.9	33.6	11.2	5.05
Tucson Div.†	2 9	27	79,2	2 9 0	57.9	.....	19.25	.....	.....	.....	.....	2.84	29 2	0.49	0.42	8.05	0 82	11.2	5.05
Rio Grde & El Paso Divs.†	283	20	87,434	3 171	46.27	.....	15.07	.....	.....	.....	.....	1.92	24.17	0.6	0.31	9.3	36 31	1 22	5.05
California Pacific Div.†	179	13	49,329	2 2 6	29.36	.....	21.99	.....	.....	.....	.....	4.8	16.32	0.46	0.79	7.24	29.48	6.4	4 40
Stockton & Copperopolis†..	49	..	6.08	2,27	.....	65.38	28.95	.....	.....	.....	.....	2.05	6 73	0.31	0.31	6.3	15.75	....	4.40
Sacramento Div.†	119	26	86,108	3 2 1 7	.....	24 8	20.77	.....	.....	.....	.....	4.77	17 71	0.44	0 47	8.77	32 19	.....	4.40
Oregon Div.†	151	7	23,494	3,356	.....	44 41	26.04	.....	.....	.....	.....	7.80	9 91	0.76	0.08	6 90	25.14	.....	4.40
Truckee Div.†	205	14	60,107	2,3 3	29 62	86.9	18.89	.....	.....	.....	.....	2.59	20 5	0.46	0 7	8.7	32.15	6.40	4.40
Humboldt Div.†	20	2	6,384	2,8 4	86.	.....	31.48	.....	.....	.....	.....	6.7	16.59	0.44	0.3	7.7	31.1	6.4	4.40
Salt Lake Div.†	219	12	87,783	2,74	55 84	.....	15.9	.....	.....	.....	.....	6.00	24.72	0.83	0.23	7.06	38 6	6.40	4.40
Chi. & Eastern Ill., Main Line‡	16	56	139,447	.....	29 0	.....	17.0	.....	15.5	.....	.....	2.40	5 58	0.40	.....	5.4	13 79	...	....
Terre Haute Div.‡	65	)	27 8 4	.....	32.09	.....	6.8	.....	9.20	.....	.....	4.30	4 90	0.40	.....	5.10	14 60	....	....
Cleveland & Pittsburgh*	225	78	202,170	2,592	37.35	.....	18.8	4.10	16 10	3.887	1.012	3.80	4.23	0.65	3.64	6.6	19.05	1.55	2.70
Dela., Lacka. & Western, Bloomsburg Div.§	80	27	78,732	2,9 9	.....	.....	29.45	.....	.....	.....	.....	2.17	.....	0.62	.....	4.8	7 59	.....	.....
Erie & Pittsburgh*	98	19	73.96	2,35	32.17	.....	14 9	3 9	15.4	2.588	1.167	3.69	6.12	0.80	1.54	7.25	19.4	1.9	1.97
Grand Rapids & Indiana	332	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Illinois Central, Chicago Div.‖	56	102	2 5,11	2,501	28 15	.....	12.73	5 46	18.18	.....	.....	3.05	6 08	0.32	.....	5 70	15.2	1 65	3.05
Middle Div.‖	100	23	20,1	876	36 79	.....	14.07	1.94	13.69	.....	.....	2.74	6.31	0.29	.....	4 95	14 25	1 65	3.05
North Div.‖	345	63	177,76	2,8 8	24.6	.....	12.86	3.82	13.26	.....	.....	3.82	6.89	0.32	.....	5 51	16.54	1.6	3.05
Springfield Div.‖	113	12	31,38	2,6	38.4	.....	15.45	1.9	11.71	.....	.....	2.04	5.08	0.33	.....	5 4	13.51	1.40	3 09
Iowa Div.‖	44	4	12,742	2,85 9	2 55	.....	14.85	3.9	11.56	.....	.....	3.26	10.53	0.28	.....	5.82	19.89	1.40	3.09
Jeff., Madison & Indianap.*	226	48	12 1,356	2,57	3 4.8	.....	15.12	3.10	22.51	5.230	0.960	4.78	8.70	0.44	2.19	7.96	24.07	2.7	2.45
Kan. City, St. Jo. & Coun. Bl'f	247	4	138,446	3,377	33.26	.....	22.80	3.8	21.40	.....	.....	3.70	6.70	0.3	.....	6.6	16.70	2.20	3.53
Lake Shore & Mich. Southern	...	89	227 5 7	2,556	32.70	65.2	14.70	.....	.....	.....	.....	3.85	8.11	0.28	.....	6.00	18 27	2.60	5.69
Buffalo Div.‡	...	126	316,.2	2,5 9	34.4	.....	27.32	.....	.....	.....	.....	4.51	7.45	0.39	.....	5.82	18.11	2.27	5.43
Erie Div.‡	...	96	25,329	2,53	25.57	65.77	17.04	.....	.....	.....	.....	3.81	1.55	0 40	.....	6 28	1.06	2.67	4 08
Toledo Div.‡	...	29	6 3,089	2.9	32..9	63.84	19.10	.....	.....	.....	.....	3 49	9 08	0.33	.....	5 85	19.37	3.10	4.63
Mich. Southern Div.‡	...	225	63,089	2.9	.....	63.84	19.10	.....	.....	.....	.....	3.49	9 08	0.33	.....	5 85	19.37	3.10	4.63
Little R'k, Miss. Riv. & Texas.	155	14	37,9	1,996	.....	57.00	9.00	.....	.....	.....	.....	3.63	3 64	0.78	1.37	7.15	17.5	.....	2.25
Louisv'e & Nash., First Div.**	437	5	128,854	2 0 6	26.02	.....	11.87	5.25	16.81	2 960	1.486	2. 6	7.65	0.48	1.45	6.6	18.51	1.96	2 19
Second Div.**	200	26	58,8 3	2,25	3 .31	.....	15.92	4.5	15.27	2.760	1 2 0	2.71	5.81	0 34	1.94	6.6	17.40	1 7	2.09
Memphis Div.**	130	1	33,62	2,441	3 .19	.....	12.99	4.74	4. 4	3.110	2 230	3.96	7.42	0.43	1.8	6.3	19 67	2.33	2. 0
Nash. & Decatur Div.**	122	2	7 9 9	2.83	38.4	.....	14.57	4 68	13.7	3.56	1 430	4. 5	6 52	0.3	1.34	6.6	9.9	1.8	2.30
South & North Ala**	159	37	105,70	2,843	4.5	.....	14. 4	4. 3	15.18	3.950	1.500	0.49	7.59	0.34	1.07	6 07	21.24	1.74	2.50
Mobile & Montgomery**	18	31	75 3	2.43.	3 .31	.....	13.23	5.5	15. 8	3.170	1.389	5.31	7 82	0.49	1.01	6 90	2 .74	2.6.	1.50
St. Louis Div.**	297	73	90,69	2,02	3 .21	.....	13.8	2.94	12.8	3 960	1.43	4.45	4 51	0.32	1.45	5.8	6.6	1.5	1.99
Ev., Hen. & Nash. Div.**	135	26	81,72	3 3 3	23.2	.....	11.94	2.90	13.05	5.290	1.610	4.8	5.9	0.34	1.84	6.4	18.88	1.25	1.75
New Orleans Div.**	141	24	70,5 1	2,940	40.66	.....	14.07	4.4	20.08	3.95	0.865	4 13	6.39	0.34	0.87	6.3	18.8	3.6	1.99
Pensacola & Selma Divs.**	131	39	36.96	948	47.05	.....	12.22	.....	8.07	.....	2.12	1.82	5.31	0.51	0.69	6.5	14.9	2.59	1.79
Louisv., Cin. & Lexington**	225	4	116,4 5	2,9 2	31.02	.....	13 29	4.8	13.76	3.810	1.892	5.27	8.65	0.49	1 31	6.67	22.37	2.65	2.45
Marquette, Hough. & Ont.	83	13	19,5 2	1,506	31.11	.....	18.09	.....	21.58	.....	.....	2.65	13 65	0.50	.....	5 69	22.49	.....	.....
N. Y., Pa. & O., Eastern Div.	22	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Western Div.	197	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Mahoning Div.	141	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norfolk & Ocean View††	8	2	1,490	7 0	175.0	.....	43.75	.....	4.00	.....	.....	0.14	3.42	0.38	.....	7 85	11.69	0.60	.....
No. Cent., El. & Can. Divs.	147	47	112,339	2,39	24 66	.....	16.13	.....	.....	.....	.....	4.14	7.37	0.61	.....	6.4	18.52	1.8	1.76
Ohio Central.	231	58	137,98	3,613	34.32	.....	19.29	.....	.....	.....	.....	4.63	3 00	0.35	.....	5.35	13.33	...	....
Pennsylvania, N. Y. Div.‡‡	12	125	4 29,802	2,38	2..68	.....	8.73	.....	.....	.....	.....	6.6	10.99	1.0	.....	.....	18.50	3.00	3 68
Amboy Div.‡‡	214	57	116.432	2,39	42.98	.....	12.56	.....	.....	.....	.....	3.70	7.00	0.70	.....	.....	11.40	3.0	3 69
Belvidere Div.‡‡	80	41	78,2 2	1,93	26.49	.....	11.42	.....	.....	.....	.....	3.90	11 50	0.80	.....	.....	16.3	3.00	3.68
Philadelphia Div.‡‡	209	163	520,965	3,196	23 26	.....	10.55	.....	.....	.....	.....	4.70	5.40	0.9	.....	.....	11.00	1.2	2 72
Middle Div.‡‡	132	105	356,38	3,394	20.29	.....	12.96	.....	.....	.....	.....	4.00	6.20	0.70	.....	.....	10.9	1.20	2.72
Altoona Div.‡‡	56	24	54,842	2,28	39.76	.....	14.25	.....	.....	.....	.....	6.90	3.10	0.60	.....	.....	10.6	1.20	2.72
Pittsburgh Div.‡‡	172	201	570,643	2,839	22.39	.....	10 33	.....	.....	.....	.....	5.90	5.40	0.9	.....	.....	12.20	1.2	2.72
Tyrone Div.‡‡	162	40	100,803	2,520	17.24	.....	15.77	.....	.....	.....	.....	2.00	7.00	0.70	.....	.....	9.70	1.20	2.72
West Penn. Div.‡‡	104	22	46,414	2,11	34.55	.....	33.11	.....	.....	.....	.....	2.9	3.60	0.40	.....	.....	6.8	1.20	2.72
Lewistown Div.‡‡	63	10	24,083	2,008	21.27	.....	17.79	.....	.....	.....	.....	6.40	5.70	0.50	.....	.....	12.60	1.2	2.75
Bedford Div.‡‡	57	5	13,500	2,700	28.05	.....	21.19	.....	.....	.....	.....	10.2	4.30	0.40	.....	.....	14.9	1.20	2.69
Frederick Div.‡‡	109	10	23,140	2,314	28 6	.....	20.24	.....	.....	.....	.....	10.70	4 30	0.60	.....	.....	15.60	1.20	2.72
Monongahela Div.‡‡	54	15	35,968	2,398	41.81	.....	10.62	.....	.....	.....	.....	4..0	2.90	0.70	.....	.....	8.10	1.2	2.76
Phila., Wil & Baltimore, Maryland Div.‡‡	93	67	206,395	3,081	41.78	.....	9.97	.....	.....	.....	.....	4.00	6.90	0.70	.....	.....	11.60	2.80	2.96
Central Div ‡‡	87	2	39,198	1.959	37.02	.....	9 98	.....	.....	.....	.....	2.90	7.60	0.60	.....	.....	11.50	2.80	2.96
Delaware Div.‡‡	97	18	34,138	1,897	41.56	.....	11.99	.....	.....	.....	.....	3.50	7.00	0.50	.....	.....	14.00	2.80	2.96
Pitts., Ft. Wayne & Chicago, Eastern Div.*	493	164	509,609	3,107	32.90	.....	18.18	4.50	15.50	3.074	1.081	2.84	5.67	0.65	1.66	6.43	17.25	1.87	1.87
Western Div.*	280	..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pitts., Cin. & St. Louis, Little Miami Div.*	197	38	152,901	4,001	38.41	.....	13 93	4.42	15.83	2.493	1.18	4.34	5.55	0.58	3.04	5.72	19.23	2.10	1.65
P., C., & St. L. Div.*	247	103	340,812	3,3.0	26.23	.....	19.38	6.11	16.45	2.120	1.110	6.35	3.79	0.50	2.53	5.73	18.9	0.95	2.30
Wabash, St. L. & Pacific, Chicago & Iowa Div.	686	102	313,645	3,075	26 45	.....	15.98	.....	.....	.....	.....	5.92	4.43	0.43	.....	6.94	17.72	1.50	2.50
West Jersey‡‡	163	19	47,456	2,498	32.39	.....	10.57	.....	.....	.....	.....	6.40	10.60	0.70	.....	.....	17.70	3.40	4.21

YEAR 1881.

Allegheny Valley, River Div*	189	49	1,990,380	40,620	32.67	.....	20.38	3.30	21.70	4.833	0.931	6.68	4.29	0.54	.....	6.42	17.93	.....	.....
Low Grade Div.*	120	24	527,269	21,970	28.50	.....	16.65	2.90	21.20	3.345	1.108	4.70	4.20	0.70	.....	6.60	16.20	.....	.....
Atchison, Topeka & S. F....	179	251	7,349,331	29,280	25.71	.....	11.12	.....	.....	.....	.....	4.44	10.11	0.60	0.29	7.47	22.91	2.53	4.0
Cairo & St. Louis††	152	22	545,449	24,439	.....	.....	.....	.....	.....	.....	.....	6.38	3 22	0.33	1.51	7 27	18.71	.....	.....
Chi., Mil. & St. Paul	3 39	527	14,966,53	28,399	.....	.....	.....	.....	.....	.....	.....	4.30	11.93	1.30	.....	7.96	25.49	.....	.....
Clev., Col., Cin. & Indianap..	472	150	4,084,297	31,229	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17.46	.....	.....
Kan. City, Ft. Scott & Gulf..	365	...	1,187,639	.....	45.70	.....	12.40	.....	.....	.....	.....	3.57	3.32	0.40	.....	6.57	14.76	1.87	2.8
Michigan Central	950	254	8,992,760	35,404	29.22	35.77	9.14	5.12	21.77	.....	.....	4.01	8.96	0.37	.....	6.42	19.76	.....	.....

* Five empty cars rated as three loaded ones.
† Switching engines allowed 6 miles per hour; helping engines, actual distance run.
‡ Switching engines allowed 6 miles per hour.
§ Fuel not estimated.
‖ Two empty cars rated as one loaded one.
¶ Three empty cars rated as two loaded ones.
** Switching engines allowed 6 miles per hour; five empty cars rated as three loaded ones.
†† Narrow gauge road.
‡‡ Engineers', firemen's and wipers' wages not included in cost.
The ton of coal is 2,000 lbs., unless otherwise noted; 25 bushels counted to the ton.
Repairs generally include all shop expenses.

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EDITORIAL ANNOUNCEMENTS.

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Addresses.—*Business letters should be addressed and drafts made payable to* THE RAILROAD GAZETTE. *Communications for the attention of the Editors should be addressed* EDITOR RAILROAD GAZETTE.

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies, the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published*

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THE CHICAGO, MILWAUKEE & ST. PAUL.

The Chicago, Milwaukee & St. Paul Company has now a larger mileage owned by one company than any other corporation in the world. The only owners of a greater railroad mileage are the Prussian government and the Italian government. There are in this country, however, larger owners of railroad *property*, for the Chicago, Milwaukee & St. Paul's system is one of the cheapest in the world, and has a larger proportion of new road, which, like all new road in new country will require large expenditures to complete and equip it as traffic grows, than any other great railroad company. In 1873 it had 1,399 miles of road, and at the close of 1878 only 140 miles had been added. In the three years following the additious have been 692, 1,544 and 442 miles respectively, bringing up the total to 4,217 miles, which is three times as much as in 1877.

Not all of these additions were constructed after 1877, it is true. Several hundred miles in Illinois, Wisconsin, Minnesota, Dakota and Iowa were bought in 1879 and 1880, most of which were roads which were built shortly before 1873, had been in receivers' hands, and were sold for less than their original nominal cost, like the Chicago & Pacific, the River roads, the Davenport & Northwestern, etc. But a very large amount of new road has been built by the company, mostly in Iowa, Minnesota and Dakota, and most of this new road is in new country, very thinly peopled when the lines were built, and depending for profits on the rapid settlement of that country.

The construction of such lines may be very profitable to a company like the Milwaukee & St. Paul, if made in the right places and at the right times, as, if too many rival lines are not built, they are sure at some time to have a large traffic of their own, and a very large part of this traffic will be hauled four or five hundred miles or more over old lines. Moreover, by the construction of such lines much is done to secure a territory in which, in later years, profitable branches may be constructed. Others cannot be prevented from invading this territory, it is true; but as, usually, the company already there can gain more by new lines than any other company, it is likely to have most of the railroads built thereafter in the country adjacent to its pioneer lines. These are matters of great importance to every company whose lines reach the borders of unsettled country, and they create a great temptation to "go in and occupy the land." For $20,000 a mile or less, perhaps, roads may be built sufficient for present requirements and capable of development, by gradual improvement as traffic grows, into first-class roads, likely at some time perhaps to earn $10,000 and even $20,000 a mile gross per year. To incur a yearly interest charge of $1,200 per mile a year to secure such lines is the height of wisdom, *if the traffic will grow fast enough.* Should the new lines by themselves and by their contributions of traffic to the old lines pay the interest on their cost within two or three years, they may be magnificent investments; though even then there may be trouble in providing the interest on their cost for these two or three years, if too many of them are built. If the country grows rapidly for several years, what cost originally $20,000 a mile, and required a few thousands more for additional equipments and improvements, may yield a profit of $2,000, $3,000 or $4,000 a mile, and will pay, perhaps, 10, 15 or 20 per cent. on its cost by its contributions to the traffic of the old lines and its own net earnings.

The Chicago, Milwaukee & St. Paul more than any other company seems to have had faith in the rapid growth of the Northwest—of that part of it south of the Northern Pacific and north of Nebraska, where its new lines are. Of 724 miles of road built in Dakota in 1880, it constructed 228 miles and bought some besides; of 390 miles built there last year, it constructed 158 miles, and it has now more than 600 miles of road in that territory, in ten different lines and branches, 500 built within the last three years, besides nearly 300 miles in thinly-peopled parts of Minnesota and Dakota. Its other large additions have been in a comparatively old country, and were mostly bought and not built by this company, most of them having been worked for several years—three of the longer lines as much as ten years.

The vast additions to the company's property have been made at a very low average cost per mile. At the end of 1878, when it owned 1,512 miles of road, and at the end of 1881, when it owned 4,217 miles, the stock and bonds outstanding were:

	1881.	1878.	Increase.
Miles.	4,217	1,512	2,705
Common stock	$20,404,261	$15,404,261	$5,000,000
Preferred stock	14,401,483	12,279,483	2,122,000
	$34,805,744	$27,683,744	$7,122,000
Per mile	8 253	18,309	
Bonds	80,168,745	32,088,500	48,080,245
Per mile	19,011	21,223	
Total stock and bonds	$114,974,489	$59,772,244	$55,202,245
Per mile	27,264	39,532	

Thus the addition of 2,705 miles of road was made with an addition of capital amounting to but $2,633 of stock and $17,778 of bonds per mile; and the new bonds being 6's and 5's, the fixed charge per mile of the additions is less than $1,000. If they earn so much net, directly and by their contributions to the traffic of the old system, they will not be a burden to the company. This is a small amount, but it is not likely that some of the new lines on the border will do so well at first; though the present great influx of immigration tends to hasten the time when the poorest of them will become self-supporting.

The only capital raised by new stock for this great addition of mileage was by the issue of $5,000,000 of common stock at par to the stockholders last year. The additions to preferred stock were by the convertion of bonds issued with that right, and meanwhile the total capital has nearly doubled. With the exception of this $5,000,000, the roads built and purchased have been paid for with bonds. Yet the cost of the additions have been so much less than that of the old lines that even the debt per mile has decreased, while the stock per mile has become comparatively trifling.

Four years ago it required an average profit of a little more than $2,500 per mile to pay the fixed charges and 6 per cent. on the stock; to pay interest on the debt outstanding at the beginning of this year and 6 per cent. dividends requires a profit of but $1,700 per mile of road, and for every $83 of additional profit per mile an addition of 1 per cent. to the dividend becomes possible.

This latter statement shows of itself the enormous profit which the stockholders may reap if the company's new acquisitions develop traffic rapidly. The policy of paying the whole cost of these roads with bonds leaves to the stock, which represents the capital of but 1,640 of the 4,217 miles of road, the profits of the entire system in excess of $1,200 per mile. Should they be $2,400, which is but 6 per cent. on $40,000 per mile of road, the stock would earn more than 14 per cent. On the other hand, this policy makes the stock suffer the losses of this immense system, and a comparatively small decrease in profits will be equivalent to the whole amount paid in dividends in any year heretofore. Last year the net earnings were $1,751 per mile on the average length operated.

All these calculations are on the assumption that the stocks and bonds outstanding at the end of last year represent the whole cost of 4,217 miles then completed. Probably a part of the floating debt also should be charged to capital, and as the company is still constructing road, additions are made from time to time to meet the cost.

Moreover, these cheap roads will require considerable expenditures for improvements and additions from year to year, and part of the addition to the profits, which the growing traffic will yield, will be required for interest on capital to be raised hereafter. With favoring circumstances, however, a very large increase in the possible dividends may be had, more than almost any other road, simply because the amount of stock per mile is so very small.

OPERATING EXPENSES.

The increased cost of working railroads, which the accounts of the various companies show, is no doubt the cause of great solicitude to managers as well as stockholders at the present time. That it is due to the general increase in the cost of materials and labor does not help matters, because, unfortunately, rates of freight and fares do not follow the market or the prices of other commodities. How to keep expenses down when the cost of materials and wages go up is the perplexing question which managers must ponder over. It is also true that the cost of railroad transportation has been steadily going down during the last thirty or forty years, but it does not diminish the perplexity of a manager to be told that this downward tendency seems likely to continue in succeeding years. The thing which he is called upon to do is to reduce expenses at once, so as to make a better showing in the next quarterly, semi-annual or yearly report. To do this there is no time for searching analysis, even if the necessary data were at hand, which usually is not the case. The squeezing process is then the only one which can be adopted, that is, notice must be given that fewer men are to be employed, and less money expended by the various departments, and that those in charge must get along the best way they can with the diminished expenditure. It is a process which is, or has been, quite familiar to most of us in our private affairs, and which nearly all families in limited circumstances are compelled to resort to. Still, the maintenance of a great railroad is a much more complicated affair than that of an individual or household. The subtle processes by which an individual, or the elaborate discussions by which the various branches of a family determine how to secure the greatest amount of comfort from a given sum of money, are in a great measure inapplicable to a railroad. Personal observation or knowledge of all the details of the latter it is impossible for any manager to make or have. He must, therefore, depend largely upon statistics to indicate to him the condition of things and show him where the money goes to. The nature of his knowledge will be dependent largely upon the character of these statistics, and his ability to analyze them. Or perhaps it would be nearer the truth to say that the kind of statistics which he will want will be dependent upon his capacity for analyzing the nature of the expenses, and his knowledge of the details and principles which determine them.

As the subject may be made plainer to readers if it is illustrated by an actual example, the statement of expenses, and their division, which is given in the last annual report of the Lake Shore & Michigan Southern Railroad, is reprinted from that document, and is as follows:

Operating Expenses and Taxes of the Lake Shore and Michigan Southern Railway.

	Expenses.	Per cent of total expenses.	Per cent. of earnings.
Salaries, gen'l officers and clerks	$298,926.70	2.65	1.65
Law expenses	46,121.13	.41	.26
Stationery and printing	69,460.01	.61	.39
Outside agencies and advertising	250,266.35	2.22	1.39
Contingencies	35,261.81	.31	.20
Repairs of bridges (including culverts and cattle guards)	139,607.65	1.24	.78
Repairs buildings and fixtures	313,470.76	2.78	1.74
Repairs fences, road crossings and signs	63,604.90	.56	.36
Rail renewals	414,264.44	3.67	2.31
Tie renewals	288,258.72	2.56	1.60
Repairs roadway and track	963,303.12	8.54	5.36
Repairs locomotives	698,705.33	6.20	3.89
Fuel for locomotives	1,225,607.87	10.87	6.82
Water supply	68,078.49	.60	.38
Oil and waste	122,880.48	1.09	.68
Locomotive service	981,024.46	8.70	5.46
Repairs passenger cars	220,363.85	1.95	1.23
Passenger train service	179,990.48	1.60	1.00
Passenger train supplies	23,774.43	.21	.13
Repairs freight cars	677,468.29	6.0	3.77
Freight train service	580,876.16	5.15	3.23
Freight train supplies	15,665.70	.14	.09
Telegraph expenses (maintaining and operating)	243,837.83	2.16	1.36
Damage and loss to freight and baggage	49,721.00	.44	.28
Damage to property, including cattle	38,961.60	.34	.22
Personal injuries	20,573.75	.18	.12
Agents and station service	2,099,691.68	18.62	11.67
Station supplies	80,020.33	.71	.48
Rents payable	106,597 13	.95	2.72
Hire of cars (debt balance)	489,479.09	4.34	.59
Total operating expenses	$10,805,863.54	95.81	60.13
Taxes	472,565.65	4.19	2.67
Total operating expenses and taxes	$11,278,429.19	100.00	62.76

It will be seen from this table that the expenses are divided under thirty different heads. These may be arranged in four classes, the first including the cost of "service," that is the wages of employés engaged in

carrying on the business of transportation, the second maintenance of road, the third maintenance of rolling stock, and the fourth general expenses, as follows:

1. *Service.*

	P. c. of total.
Salaries agents, officers and clerks	2.65
Locomotive service	8 70
Passenger train service	1.60
Freight train service	5.15
Agents and station service	18.62
	36.72

2. *Maintenance of Road.*

Repairs bridges, etc	1.24
" buildings and fixtures	2.78
" fences, etc	0.56
Rail renewals	3.67
Tie renewals	2.56
Repairs roadway and track	8.54
	19.35

3. *Maintenance and Movement of Rolling Stock except Train Wages.*

Repairs locomotives	6.20
Fuel for do.	10 87
Water supply	0.60
Oil and waste	1.09
Repairs passenger cars	1.95
" freight cars	6.01
	26.72

4. *Other Expenses.*

Law expenses	0 41
Stationery and printing	0.61
Outside agencies and advertising	2.22
Contingencies	0.31
Passenger train supplies	0.21
Freight train supplies	0.14
Damage and loss to freight, etc	0.44
Damage to property, etc	0.34
Personal injuries	0.18
Station supplies	0.71
Telegraph expenses (a little for maintenance)	2.16
Rents payable	0.95
Hire of cars (debit balance)	4.34
Taxes	4.19
	17.21

It will be noticed from these statements that the class of expense which costs the most is that of "service," or wages to persons engaged in carrying on the business of transportation, not including those employed in repairs. This class is 36.72 per cent. of the whole. Next to it is what we have called the maintenance and movement of rolling stock, which is 26.72 per cent., then maintenance of road 19.35 per cent., leaving as the "other" expenses 17.21 per cent.

If we look at the first and most formidable class of expenses, with a thought of interrogation as to how they may be diminished, of course the first answer which suggests itself is to reduce the rates of wages. This may be done at times, whereas at others it cannot. The present seems to be one of the occasions when this method is not available. How long this will be the case the future only can answer. Another method though may be resorted to, that is, to devise and employ such means as will enable a given number of men to do more work. The first plan has the very great advantage that it requires no intelligence, skill or knowledge to adopt. The stupidest director, the dullest president or most obtuse superintendent will know enough to "cut down wages." The other plan though requires a great deal of special knowledge and skill, and without these is very apt to result in failure. The one is usually easy and safe, whereas the other is difficult and is attended with a risk of failure proportionate to the ignorance or lack of knowledge of those who undertake to adopt it. Still, as has been remarked, the safe and easy method is not available just at present, and therefore we will take the different kinds of service included under the first class of expenses, and see where, if at all, any reduction may be looked for.

The first, "salaries of officers and clerks," it will be seen, is, at least on the Lake Shore road, a very small percentage, 2.65, of the whole operating expenses. The cost of it, too, is very apt to be much over-estimated, especially the cost of mere clerical work. One reason for this is, that those employed in doing the latter come under the observation of officers and directors much more than any other source of expense does. Their work, too, does not apparently produce anything which has actual value, and, consequently, when some old gunny-bags, whose fortune it may be had its beginning in the economies which he effected by saving odds and ends in the grocery business, sees what appear to him useless clerks doing work which he cannot understand, he applies the principles of the grocery trade to the management of a railroad and wastes a hundred-fold more money through channels that he does not see or comprehend, in order to effect a petty saving in clerk hire. Of the uses of clerical work more will be said hereafter.

But to show that very little can be effected in this way of reducing expenses by saving in clerk hire, it may be said that the employment at fifty dollars per month of one hundred clerks more or less, or half that number at double the pay, on the Lake Shore road would represent an expense equal to only a trifle over one-half of one per cent. of the total expenses. An increase of 3½ per cent. in the average train-loads would save more than that in the cost of the service of the trainmen, and a reduction of 5 per cent. of the fuel expenses would represent an equal sum. There is many a director, and a good many managers, who will be wrought up into a state of wrath at the presence of a few clerks who appear to be unnecessary, while yet these officers cannot be induced to give a thought to the construction of the wheels or the shape or material of the rails, while thousands of the former are constantly grinding away the latter, and are being ground at a cost of somewhere in the neighborhood of a million and a half of dollars per year on the road which we have selected as our example, while at the same time it is possible to diminish the wear of both very largely, by simply designing the one for the other, instead of making the one without reference to the other, as has heretofore been the practice.

The direction in which to seek a reduction in the cost of locomotive and freight train service is, as has been indicated, in an increase of the average train loads. This, of course, can only be accomplished by having more powerful locomotives and stronger cars. It is true, of course, that there is a limit to the length of a train and of the number of cars which can be handled to advantage, but when that limit is reached with cars of the usual construction, the train load may still be increased by making cars of greater capacity. That the limit of the latter has yet been reached is hardly probable. It then comes down to a question of mechanical design, and the loads which will be hauled will depend upon the construction of the locomotives and cars. That there are difficulties in the way of increasing their capacity everyone who has any practical knowledge of the subject knows too well. If we were at liberty to widen the gauge of our roads, with the loads to be hauled, there would not be much trouble. As it is, we have made the boilers of the locomotives as large as is possible on the present gauge, and the cars are as wide as it is thought safe to make them. Some new departure, some stroke of genius which will make more powerful locomotives possible, seems to be impending. Be that as it may it is nevertheless true that there are comparatively few roads on which the limit of train loads has yet been reached. If an increase is still possible we have the three items of locomotive, freight and passenger train service, on which a reduction can be made. These amount to 15.45 per cent. of the total expenses. It is, of course, obvious that to increase the average train loads has the effect of diminishing these items in the same proportion.

Circumstances alone can determine whether the cost of "agents and station service," which is a very large item of expense, is capable of reduction. Where business is concentrated, it seems possible to make very great improvements in our appliances for handling freight. The illustrations which have recently been published in these pages of an English goods station show what is done in the older countries. That we are very much behind them in the use of such appliances is only too evident to any one who has the opportunity of examining these appliances abroad. That these methods could be transplanted, just as they are, and serve our purpose is not at all probable. A process of adaptation must be the preliminary stage, and no doubt they will be much modified before they are exactly suited to our wants. But here it is the mechanical engineer again who must be looked to for the means of reducing these expenses. To do this he must have a thorough knowledge of the principles and the details of construction of such machinery. The cherished "practical man" will not do for the work, although, of course, the right man for it would be of all things *practical*. But it would be in a different way from that in which the word is usually understood. Generally what is considered one of the essentials in a "practical" man is ignorance of theory, science and what the patent attorneys call the "state of the art." Of the latter it may be said that during the past quarter of a century there has been an immense accumulation of experience in Europe in the construction and use of cranes and hydraulic machinery of which we in this country are in almost profound ignorance. It would be the height of folly to ignore their experience.

To design appliances for diminishing the cost of station service a person should therefore be thoroughly familiar with what engineers have been doing in that line in other countries, and he should know enough of general principles to apply that knowledge and be thoroughly familiar with details and methods of construction, and in that meaning of the word be *practical* in a very eminent degree. He must have, too, the capacity for designing work which if not mechanical genius itself is very near akin to it. He should in the broadest sense be a good draftsman and have, combined with that kind of skill, the faculty of using it in the construction of machinery, so as to get the best results with the least cost.

This article has grown to such proportions though that its completion must be reserved for a future number. The moral of it thus far is that the person to whom to look for a reduction of the 36.72 per cent. of expense for "service" is the man who can improve the locomotives and cars and can construct machinery to handle freight more economically than it is now handled. Persons competent for such work are rare, and unfortunately railroad companies here are doing little or nothing to encourage or cultivate this kind of skill and knowledge.

THE MICHIGAN CENTRAL REPORT.

The Michigan Central report this year is interesting for the light it throws on the Lake Shore as well as on itself. It too is a road with a very large proportion of through traffic, the profit on which for one-half of the year was destroyed by the railroad war. Like many other roads with through traffic, it had a great increase of passenger traffic (17½ per cent.), and two-thirds of this increase was in local traffic, so that the great reduction in through fares in the last half of the year did not prevent a large increase (10¼ per cent.) in passenger earnings. In freight traffic there was an increase of 7.3 per cent. in the through and of 7.8 per cent. in the local movement—7.4 per cent. in all—but with a decrease from 0.842 to 0.718 cent (14¾ per cent.) there was a decrease of 8.4 per cent. in the freight earnings; but after all the decrease in gross earnings was an unimportant one—$150,880, or 1¼ per cent. The serious change is the increase of $993,345 (17.3 per cent.) in expenses. This reduced the net earnings $1,144,762 (34 per cent.) and the surplus over fixed charges from $1,690,588 in 1880 to $509,309 in 1881. The profits per share fell from $9.02 to $2.72.

Now let us compare this with the results on the Lake Shore:

	Mich. Cen.	Lake Shore.
Increase in passenger traffic	17.5 per cent.	18.0 per cent.
" " " earnings	14.3 " "	9.9 " "
" " freight traffic	7.4 " "	9.3 " "
Decrease in freight earnings	8.4 " "	10.1 " "
Increase in train miles	17.6 " "	12 2 " "
" " expenses	17.3 " "	8.2 " "
Decrease in net earnings	34.0 " "	19.7 " "

The growth in passenger traffic was about the same on both roads, but the increase in passenger earnings much greater on the Michigan Central, which is due to the fact that two-thirds of its increase was in local passengers, who paid full rates, while only one-third of the Lake Shore's increase was in local passengers. The enormous increase of 26 per cent. in the Michigan Central's local travel has rarely been equaled on any old railroad.

In freight traffic the increase was greater on the Lake Shore, and so was the *decrease* in freight earnings, and this too is probably due to the growth on the Lake Shore being mostly through freight; while on the Michigan Central the rate of increase was larger in local than in through. Nearly three-fourths of the latter road's freight traffic (71½ per cent.) is through, however, and as it reports through and local freight earnings separately, we are able to see just how much of the decrease in earnings was due to the low through rates—to the railroad war. It was $794,306; caused by carrying 7.7 per cent. more through freight at a reduction of 29 per cent. (from 0.648 to 0.461 cent per ton per mile) in the average rate. For in local freight there was not only an increase in the amount (6.7 per cent.), but an increase in the average rate from 1.326 to 1.364 cents per ton per mile, so that the local freight earnings were larger by $274,067, or 9.8 per cent.—a very satisfactory result indeed, considering that the local traffic of the road in the last four months of the year was greatly lessened by the failure of the Michigan wheat crop.

The Buffalo-Chicago freight of the Lake Shore was but 31½ per cent. of the total, but if we included all the traffic carried by this road at through rates—that to and from and interchanged at Erie, Cleveland, Toledo, etc., it would probably be about as large a proportion of its total as the Michigan Central's 71½ per cent., and its local rates are probably more affected by the through rates than the Michigan Central's, which we see were maintained, and even advanced, in spite of the railroad war. On it the local freight, though but 28½ per cent. of the total, yielded nearly 55 per cent. of the total freight earnings, the average local rate being nearly *three times* as great as the average through rate.

When we come to profits the difference must be vastly greater. As nearly as ascertainable, the average expense per ton per mile was 0.562 cent, but the average receipt for through freight was but 0.461 cent, and though the expenses were doubtless greater for local than for through freight, the expenses for the latter must have very nearly equaled the receipt, though the railroad war lasted but half of the year. We do not doubt that the road would have made greater profits in the last half of the year if it had had no through freight; provided it could have dispensed

entirely with the employés and equipment then unprofitably engaged, but necessary to employ as soon as rates became profitable.

With regard to passenger traffic, the decrease in the through rate was just about made up by the increase in through travel, there being the trifling decrease of $5,312 in through passenger earnings. But the increase of 10.2 per cent. in through travel must have occasioned some increase in expense, and very likely an increase nearly in proportion to the traffic, for there was very little increase in the average train-load, only from 60.2 to 61.3 passengers. As nearly as can be ascertained, the average expense per passenger mile was 1.70 cents, and the average receipt per through passenger was 1.54 cents.

The large emigrant traffic, however (28½ per cent. of the total through), is carried at much less than the average cost, and the other through traffic (this road having very large trains) at some less, and there is no doubt that the through traffic as a whole was profitable, though for part of the year it was quite the contrary. The passenger rates did not begin to go down so soon as the freight rates, and they went down gradually, being at the lowest point only three or four months. This will also account for the fact that the increase in through travel was but ten per cent. and, exclusive of immigrants, 22¼ per cent. During the competition some of the newspapers claimed that the low rates were profitable; that when the roads were charging one-half, one-third or even one-fourth of their regular rates, the travel not only doubled, trebled and quadrupled, but enough more to pay the cost of carrying the increase. But we see on this, one of the most frequented lines, an increase of but 22¼ per cent., and if it was all made in the last half of the year, it was still enough only to increase the earnings from this traffic $35,395, which would hardly pay the cost of 9,036,000 additional passenger miles.

Reducing passengers to freight we have an increase of 9.8 per cent. in the total traffic on the Michigan Central and of 10.8 on the Lake Shore; the latter's increase was carried by anincrease of 12.2 per cent. in the locomotive mileage of traffic trains, the former's by an increase of 17.6 per cent. We here take the *locomotive* mileage in the Lake Shore report, having only that to compare with it in the Michigan Central report. These show a *decrease* in the average freight train load from 201 to 184¼ tons on the Michigan Central, and from 247½ to 243⅝ on the Lake Shore—a notable backward movement on the former, which was probably partly due to the very severe and long winter, which greatly increased the train resistance on many roads, and on the Michigan Central more than on the Lake Shore, doubtless, though we should not expect to find so great a decrease due to this cause alone.

The most important comparison to make, perhaps, is that of working expenses. The increase in traffic was a little greater on the Lake Shore than on the Michigan Central, we have seen, but the increase of expenses was 17.3 per cent. on the latter and but 8.2 on the former. It is true that the increase in train miles was much the greater on the Michigan Central; but if we take expenses per train mile we have (in cents):

	1881.	1880.	Decrease.	P. c.
Michigan Central	103.6	103.9	0.3	0.3
Lake Shore	100.2	103.8	3.6	3.5

That is, there was almost no change on the Michigan Central, and a small decrease (enough, however, to amount to $394,000) on the Lake Shore.

Last week we considered especially the maintenance expenses of the Lake Shore. We found them the largest for four years and 15 per cent. more than the year before. Now the Michigan Central's maintenance expenses for the two years were:

	1881.	1880.	Increase.	P. c.
Repairs and renewals.	$2,453,115	$1,896,542	$556,573	29.3

This is nearly twice the rate of increase reported on the Lake Shore. The President reports, however, that the cost of nine additional locomotives and of four new iron bridges was included in expenses, and of 4,700 tons more steel rails than in 1880. The new rails were about 8 per cent. of the total track, which is doubtless something more than the average renewals required by steel; but the rails laid in 1880 were 4.7 per cent. of the track, which is probably less than the average requirement after all the road is steel.

What is particularly remarkable, however, is that the increase of maintenance expenses on the Lake Shore, which has two-fifths more road, 156 per cent. more freight traffic and 63 per cent. more passenger traffic than the Michigan Central, was absolutely less in amount than on the last-named road: $495,120, against $556,573. Per train-mile these expenses were 33.55 cents on the Lake Shore and 37.74 on the Michigan Central. If the Lake Shore's maintenance expenses had been at the same rate as the Michigan Central's, they would have been about $472,000 larger than reported; *vice versa*, the Michigan Central's would have been $272,000 *less* than reported.

We enlarge thus on the maintenance expenses, because it is these which can be put off or partly charged to construction, the border between a renewal and an addition not always being distinct. And the difference by different methods of charging may easily amount to a very important part of the surplus available for dividends. Apparently, if the Michigan Central's charges for maintenance were no more than proper, the Lake Shore's were too small, and *vice versa*.

It is notable also that in the expenses other than maintenance the increase on the Michigan Central was $436,771, or 11⅝ per cent.; on the Lake Shore, $365,204, or 5 per cent. These are expenses which usually it is not possible to put off or escape; that the Lake Shore should have been able to keep them so low with a large increase of traffic and of prices seems remarkable. Mr. Vanderbilt says in the Michigan Central report that the cost of labor, materials and fuel was 27 per cent. greater on that road in 1881 than in 1880, and this advance the Lake Shore could not escape.

It is due to this difference in the increase of expenses that the Lake Shore makes so much better a showing of profits than the Michigan Central. It gained but little more in traffic; its decrease in earnings was much greater ($778,070 against $151,417), but its increase in expenses was comparatively very much less. If the expenses had been charged in precisely the same way on both roads, there would not have been so great a difference in the results, as a decrease of $6.30 (70 per cent.) in the profits per share of the Michigan Central, and of only $3.26 (29 per cent.) in those of the Lake Shore, though it is true that a much larger proportion of the Michigan Central's profits is required to meet its fixed charges.

The current half-year is proba bly rather worse than better than the last half of 1881 for the Michigan Central, as for other roads with heavy trunk-line traffic. The west-bound through freight is carried at lower rates, and is probably as heavy as ever. The east-bound freight for two months was carried at lower rather than higher rates; since at much higher rates, but there is less of it than before since 1877, probably. Passenger traffic will be remunerative and heavy. The second quarter of the year should make a better showing than either the third or fourth quarters of last year, so far as through earnings are concerned; but the future of the wheat crop may make the local traffic less, though in a state with varied industries like Michigan traffic does not depend on any one crop, or even on all of them together.

The extended Jackson, Lansing & Saginaw Division is likely to make considerable gains, and will now be able to develop some through traffic with the Northern Peninsula. Expenses, however, continue high, and they probably cannot be much reduced by the reduction in east-bound freight. The hopes for the year depend upon the traffic and profits of the last half of it, which may be very large if we have large crops and a good demand for them, as there is every probability that rates will be maintained; at least it is entirely improbable that they will be as small as in the last half of last year, when, judging by the results for the whole year, the road did not more than earn its fixed charges.

THE GRAIN MOVEMENT WHILE THE CANAL WAS CLOSED.

The five months ending with April coincide this year with the period that canal receipts at New York were suspended, or nearly so, a few hundred thousand bushels having been received by canal in the last week in April, and there have never been in previous years any important canal receipts in these five months. This year and also in 1880, however, the lakes were open throughout April, and in several other years there have been some lake shipments in this month. It is thus a season of closed navigation only as regards canal receipts.

During these five months the receipts and shipments of grain of all kinds at the eight Northwestern markets and the receipts at the seven Atlantic ports have been, in bushels, for the past nine years:

Year.	Northwestern receipts.	Northwestern shipments.	Atlantic receipts.
1874	54,535,578	29,499,348	41,027,047
1875	35,930,337	18,605,849	23,686,804
1876	48,024,441	30,797,372	39,269,065
1877	43,358,882	26,600,317	40,903,919
1878	61,097,698	44,475,196	72,615,901
1879	64,389,922	40,377,517	78,692,236
1880	82,126,468	56,218,711	84,000,064
1881	74,757,807	49,355,803	74,601,389
1882	69,826,522	52,615,041	38,693,562

Thus the receipts of the Northwestern markets, though nearly 5,000,000 bushels (7 per cent.) less than last year, and 12,300,000 bushels (15 per cent.) less than in 1880, were larger than in any previous year. They were, in fact, 10,000,000 bushels more in January and February than last year, but in December 6,500,000 and in March and April 8,500,000 bushels less.

The shipments of these markets were 3,260,000 bushels (6¼ per cent.) *more* than last year, and more than in any previous year except 1880. Thus the Northwest, notwithstanding its light crops, marketed an unusually large quantity of grain during these five months.

The receipts of the Atlantic ports, however, were no less than 36,000,000 bushels, or 48 per cent., less than last year, and 45,300,000 bushels less than in 1880, and were smaller than in any other year of the nine except 1875. It appears, then, that the grain which the Northwest has received and shipped in such large quantities during the past five months has not gone to the Atlantic cities for consumption or export to anything like the extent customary since 1877. In 1879 the Atlantic receipts were 38,000,000 bushels, in 1880 28,000,000 and in 1881 25,000,000 bushels more than the total shipments of the eight Northwestern markets; this year the shipments of these markets were 14,000,000 bushels more than the Atlantic receipts. Evidently consumers have been found for the grain elsewhere than abroad or on the seaboard to an extent never known before.

The April movement shows a considerable increase over March in the Northwestern receipts and shipments, as is usual after navigation opens, and for half the month the movement was really large; but the Atlantic receipts continue to be trifling compared with previous years.

During the month of April (four weeks) the receipts of grain at Atlantic ports for six successive years have been, in bushels:

1877.	1878.	1879.	1880.	1881.	1882.
9,039,460	14,393,584	19,150,770	19,170,621	16,938,903	5,935,810

The first half of 1877 was the most unfavorable for traffic for a long time, but the Atlantic receipts of grain in April were one-half greater then than this year. Last year their receipts were 11,000,000 bushels 185 per cent., more than this year.

We must not measure the grain transportation of this season, therefore, by the Atlantic receipts, which heretofore have furnished the best measure of the traffic as a whole. The grain this year stops before it reaches the seaboard.

The distribution of the receipts among the diffreent Northwestern markets shows no great changes in April, though, lake navigation being open in that month, we might expect a large increase in the proportion going to lake ports. There is such an increase at Toledo, but not elsewhere. Toledo received but 5.5 per cent. of the grain in the first three months of this year; in April 12.2 per cent. The proportions received at St. Louis and Peoria are but little less than in previous months, which is probably due to the large interior and Southern demand. The percentage of the total received at each market in the first four months of each of the last three years (not the five months including December) has been:

Year.	Chicago.	Milwaukee.	Toledo.	Detroit.	Cleveland.	St. Louis.	Peoria.	Duluth.
1882	39.0	10.6	7.1	3.8	2.0	20.9	16.1	0.5
1881	34.4	7.9	11.6	5.0	2.9	23.8	14.4	...
1880	30.6	6.9	13.4	3.3	2.2	24.3	10.3	...

The consumption of the grain at interior and Southern points would easily account for a much larger change in the proportions received at the different markets than is shown here. The cessation, almost, of exports from New Orleans, and the great decrease in shipments down the Mississippi, have tended to decrease receipts at St. Louis, but on the other hand the extraordinary Southern demand has tended to increase them.

Detroit has this year for the first time had the benefit of a connection with the Wabash, and this might be expected to increase its receipts and decrease those of Toledo to the same extent. But the bad crops have decreased the percentage of receipts at both, a very poor wheat crop in Michigan, whence Detroit's receipts formerly came almost exclusively, more than counterbalancing the receipts by the Wabash. In April, however, Detroit as well as Toledo had a larger proportion of the whole than last year, which may be accounted for by the open lake navigation.

In the distribution of receipts at Atlantic ports the only notable change during the past month was a large increase at Philadelphia, nearly balanced by a decrease at New Orleans, and a smaller increase at New York balanced by a decrease at Boston. In March, Philadelphia received but 8 per cent. of the grain; in April, 17 per cent. The whole amount of receipts was so small that the changes cannot be regarded as significant. The percentage of the total Atlantic receipts arriving at each Atlantic port during

the five months ended with April (period of closed canal) for six successive years has been:

	1876-77.	1877-78.	1878-79.	1879 80.	1880-81.	1881-82.
New York...	31.4	40.8	40.0	38.1	39.0	49.3
Boston.....	11.7	7.9	9.1	9 4	12.7	17.6
Portland....	1 9	2.0	1.3	2.0	1.7	3.2
Mont'eal....	0.3	0.1	0,1	0.4	0.3	0.9
Philadelphia	17.8	19.5	19.0	16.8	13.2	12.2
Baltimore...	29.6	20.9	22.9	21.6	22.0	8.6
New Orleans	7.3	8.8	7.6	11.7	11.1	8.2
Total..	100.0	100.0	100.0	100.0	100.0	100.0

Thus New York and Boston have had this year a much larger proportion than ever before, sufficiently accounted for by the fact that they are the largest consumers and distributors for domestic consumption, and by the concentration of steamers at those points, which now carry nearly all the light exports.

Philadelphia has a smaller percentage this year than before for five years, though not much smaller than last year. Baltimore shows a tremendous decrease, receiving since December but 2,395,470 bushels this year, against 12,593,000 last year and 14,810,117 in 1880. In a single week of July, 1880, it received nearly as much (2,226,850 bushels) as in the first 17 weeks of this year, and it may be said to have almost gone out of the grain trade, for the time.

Comparing New York and Boston together with Philadel phia and Baltimore, we find their percentages of the total Atlantic receipts in these five months of closed canal navigation to have been:

	1877.	1878.	1879.	1880.	1881.	1882.
New York and Boston...	43.1	48.7	49.1	47.5	51.7	66.3
Phila. and Baltimore....	47.4	40.4	41.9	38.4	35.2	20.8
The four cities.....	90.5	89.1	91.0	85.9	86.9	87.7

New York and Boston this year have received nearly three and a third times as much as the other two cities, last year not one-half more, in 1880 one-quarter more, in 1877 not as much.

The opening of canal navigation has the natural effect of increasing the proportion of receipts at New York; but it can only do this within the limits permitted by the exports of grain; that is, should exports cease entirely, the canal could not much increase New York's receipts, which would be limited to its consumption and that of the surrounding country which it supplies. Then the chief effect of the canal would be to reduce the shipments of grain over the railroads which carry to New York, leaving to the lines which carry to Boston, Philadelphia and Baltimore the whole of the grain consumed there, because it cannot reach them except by rail.

New Boston & Albany Passenger Cars.

This company has ten new passenger cars in process of construction at its Allston shops, under the supervision of Mr. F. D. Adams, the Master Car-Builder of the line. They are intended for the through New York trains. They are 57 ft. long over end sills, 9 ft. 3 in. wide over side sills, 9 ft. 10 in. over eaves. There are 20 windows on each side; the first three at each end are 20×34 in., the others 23×34 in. The panels between each alternate pair of windows are 9¾ in. wide, the intermediate panels being 3¾ in. Each car has 34 seats with reversible backs and four corner seats with fixed backs, so that they will seat 76 passengers.

There are end ventilators over the windows 8×22 in. and end ventilators in the clear-story. These latter are protected by wire netting outside. The sides of the clear-story have "globe" ventilators with registers inside. These were furnished by Tillotson. The lamps, which were made by Williams & Page, are of novel design and arrangement. They are of a bracket form or L-shaped, and are attached to the side of the clear-story at the angle where it joins the lower roof. This brings the light low down and near the sides where passengers are seated. Ten of these lamps light the car so that it is possible to see to read in any part of it. The basket racks are of beautiful design, and were also made by Williams & Page. The other furnishings were supplied by the Union Brass Company. The seat ends are of cast iron of Buntin's pattern. The seats next the window have Creamer's foot rests.

The top of the water closet is covered with glass, so that the light of a lamp attached to the outside of it serves the double purpose of lighting both the car and the closet. The floor of the latter is covered with sheet copper turned up around the edge and carefully nailed with copper nails. This makes it possible to keep it clean and thus prevent the vile odors which are quite too common in such places, and which it is impossible to prevent when the wooden floor once becomes saturated with filth.

The inside of the car, including the sides and ceiling, is finished with cherry of very plain design, but which is very pleasant after the over-elaborativeness to which we have all been accustomed so long. The seats of the car which was examined were covered with dark green leather. A crowbar, an axe, a saw and a fire-extinguisher, hung in conspicuous positions on the inside of the cars, are, perhaps, not pleasing subjects to contemplate if a traveler allows his mind to dwell on the possible contingencies for which they are intended.

Some of the cars are heated with Searle's safety heater, which is made in Cincinnati; others have Salmon's heater, which is a Boston invention.

Miller couplers and platforms, 42-in. paper wheels, French's elliptic swing-motion springs, and Cliff's graduated equalizer springs, all help to make these cars excellent specimens of the latest practice in this line.

Record of New Railroad Construction.

This number of the *Railroad Gazette* contains information of the laying of track on new railroads as follows:

Chicago, St. Paul, Minneapolis & Omaha.—The *Norfolk Branch* is extended from Emerson, Neb., to Norfolk, 47 miles. The *Northern Division* is extended from Cable, Wis., northward 20 miles. Track is laid on the *Superior Branch* from Chippewa Falls, Wis., northward 20 miles.

Denver & New Orleans.—Extended southward to Pueblo, Col., 41 miles.

Kansas City, Springfield & Memphis.—Track laid from Springfield, Mo., southeast 10 miles.

Louisville, Evansville & St Louis.—Track laid from Oakland, Ind., east 14 miles; also from Huntingburg, Ind., east to Birdseye, 16 miles.

Natchez, Jackson & Columbus.—Extended from Upper Bayou Pierre, Miss., northeast to Utica, 7 miles. Gauge 3 ft. 6 in.

North Carolina Midland.—Completed from Danville, Va., west by south to Leaksville, N. C., 25 miles.

Sabine & East Texas.—Extended from Village, Tex., northward to Woodville, 20 miles.

This is a total of 220 miles of new railroad, making 2,503 miles thus far this year, against 1,018 miles reported at the corresponding time in 1881, 1,264 miles in 1880, 493 miles in 1879, 312 in 1878, and 354 miles in 1877.

LAKE RATES, which two weeks ago were 2½ cents a bushel for corn from Chicago to Buffalo, soon fell to 2¼ cents, and for some days past have been 2 cents, a figure never before reached so early in the season, though they have gone down to 1¾ cents in July, and a few times have been as low as 1½ cents. The vessels are not helped this year by the high coal rates from Buffalo to Chicago which did so much to make the low grain rates bearable this year. Instead of $1.20 to $1.50, which was paid this year (though not so early in the season), the vessels have been getting 60 to 65 cents this year, which, however, is better than was customary in years previous to 1881, when vast quantities of coal were taken for 25 cents, and more than 50 cents was seldom paid. At 2 cents a bushel corn down pays 80 cents per ton, but the vessel has more expenses to pay in this connection with grain than with coal, which latter is loaded and unloaded by the shipper, so that the vessel probably makes as much on the up trip as on the down trip, a condition of things which is favorable to cheap transportation. The low rates at which the railroads have contracted for carrying merchandise westward till July must make this freight comparatively undesirable to the propellers, even if they could get it.

Canal rates, which for some time after the opening stood at 5 cents a bushel for corn and 5½ for wheat from Buffalo to New York, then for about a week were ⅛ cent lower, this week have fallen ¼ and Wednesday stood at 4⅝ for corn and 5⅛ for wheat. Last year these rates were charged about two weeks after the opening, and they were not as high again until near the close of the season.

Ocean rates continue very low, from ¾d. to ¼d. per bushel for grain by steam from New York to Liverpool. It was at this time that ocean rates were lowest last year, but then they were from 1d. to 2d. per bushel, and two years ago they were 4½d. Scarcely any transportation rates fluctuate like these. There were several weeks in 1880 and 1879 when they reached 9d.; in 1878 for nearly two months they were 9½d. to 10d., and in 1877, 11½d. was reached. Fluctuations between ¼ cent and 23 cents are more than the differences between our lowest war railroad rates and the highest local charges; the Chicago-New York grain rate since 1877 has varied from 10 to 45 cents per 100 lbs.; but while the highest rail rate was 4½ times the lowest, the highest steamer rate was 46 times the lowest.

At present the cost of shipping corn from Chicago to Liverpool is about 8½ cents a bushel, which is less than the average ocean rate.

CHICAGO RAIL SHIPMENTS EASTWARD for the week ending April 29 have been for three successive years:

	1880.	1881.	1882.
Tons.....	30,263	58,866	29,528

This year the receipts are but about half as large as last year, but they are nearly the same as in 1880, which was the year of largest profits on through traffic. The rate then was one-fifth more than now. The receipts of the week this year are 744 tons less than the week before, and are the smallest for a year.

Of the total the Chicago & Grand Trunk carried 14.1 per cent., the Michigan Central 18.2, the Lake Shore 16 8, the Fort Wayne 26.1, the Pan-handle 7.9, and the Baltimore & Ohio 6.9 per cent. The two Vanderbilt roads have 35 per cent. of the whole, against 49 under the pool of 1880: the two Pennsylvania roads, 44 per cent. of the whole against 33 under the pool. It is notable that since the transfer of the Erie's freight lines from the Lake Shore to the Fort Wayne, while the latter's percentage has greatly increased, that of the Pan-handle, over which also the Erie has a freight line, has materially decreased. The Erie has a freight line over the Grand Trunk also, and doubtless has had a share of the recent large shipments by that road. The light grain shipments affect the Vanderbilt more than the Pennsylvania lines, as the latter always have had the larger part of the provision shipments, the decrease in which is much less than that in grain.

For the week ending May 6 the shipments billed from Chicago (not including those for points west billed through Chicago) were 21,835 tons, against 22,357 the week before. The percentages last week (which will be changed when the through shipments are included in the statement to be published next week) were 9.6 per cent. by the Chicago & Grand Trunk, 12.8 by the Michigan Central, 24.2 by the Lake Shore, 27.6 by the Fort Wayne, 14.9 by the Pan-handle and 10.9 by the Baltimore & Ohio. Only 14,490 tons of grain and flour were shipped.

A CLAIM FOR A DIVIDEND AS A RIGHT is made to the Cleveland, Columbus, Cincinnati & Indianapolis Company by Sir Henry Tyler as chairman of a committee of the holders of the "Western Extension" bonds, issued on the security of the shares of this company by the Atlantic & Great Western, as part of the scheme by which the Cleveland road and the Atlantic were to be secured as connections of the Erie. These bondholders have Cleveland shares pledged to secure their bonds, and since the reorganization of the Erie and the Atlantic & Great Western they have no other security, and as interest they receive whatever dividends are paid on this stock. No dividend was declared from the profits of 1881, though the report shows that after paying fixed charges there remained a balance of $853,518, which is about 5⅝ per cent. on the stock. But $394,646 of this went for additions to the property, and $365,000 for advances to the Indianapolis & St. Louis Railroad to pay expenses of that connection, which is not only important to the Cleveland road as giving it its St. Louis connection, but also because it has invested $976,750 in its securities, which are protected by the advances. The English stockholders contend that they are entitled to all the profits of the company after the fixed charges are paid, and that the directors have no right to use any part of such profits to make additions to the property, or investments for its benefit, without special authority. This is in accordance with English law and practice; but, without knowing anything of the authority given to directors by the laws of Ohio or the articles of incorporation of the Cleveland Company, we venture to say that they will be found to have a very extensive discretion as to the disposal of the company's profits. In fact, directors here exercise despotic powers, checked only by the annual elections, and they are authorized to do on their own motion a great many things which in England they can only do after having taken a vote of the shareholders on the question, which they do for every declaration of a dividend.

EAST INDIAN WHEAT EXPORTS have been extraordinarily large recently, and this doubtless has helped, with the vas exports of our Pacific Coast, to enable Europe to do without any considerable exports from our Atlantic Coast. The exports from Bombay in 1881 were 17,181,000 bushels, which is nearly five times as much as in 1880, when again exports were much larger than ever before. This is due partly to an extension of railroads in the Indus Valley, but chiefly, doubtless, to the sufficiency of the crops elsewhere in India. It has a population of 190,000,000, and the difference between an average crop that gives a full supply for such a population and an unusually good crop may easily amount to 300,000,000 bushels; but before the days of railroads each district depended largely on its own resources, and when there was a short crop in one of these a famine followed. Then the surplus of a good year, since it could not be sent to another district with a light food supply, was largely stored by grain merchants for several years, and went to supply the deficiency of a subsequent bad year. When the railroads are first built it is said that these accumulations (sometimes of several years) are shipped and sold by the merchants, who then for the first time can obtain a remunerative price, the world's markets being opened to them. It is not probably that India will ever become an important competitor for the supply of the European market with wheat, as it is fully populated and has no great areas of unoccupied land to bring under cultivation. But as railroads are extended in Northern India it will be able to export its surplus in favorable years and import part of its supplies in the unfavorable years, which heretofore were often years of famine. The large Indian exports of 1881 were after all but about one-sixth of the difference between the United States wheat crop of 1880 and that of 1881.

A NEW PASSENGER LOCOMOTIVE has recently been completed for the Boston & Albany Railroad by Mr. Underhill, the Superintendent of Motive Power and Machinery of this line, which, as many of our readers know, has heavy grades and heavy trains. The engine (No. 129) has 18x22-in. cylinders, 5½-ft. driving wheels, 72-in. grate, boiler 52 in. in diameter, with high wagon top and 222 2-in. tubes. The whole of the shell and fire-box is made of steel, in the former 7/16 in. thick, and it is intended to carry 175 lbs. pressure per square inch. The valve has 5-in. travel, 1 1/16 outside lap with none inside. The tender and truck wheels are of wrought iron, of English make, an engraving of which is published on another page. The former are 33 and the latter 30 in. in diameter.

The weight on the driving wheels can be increased or diminished by means of Waterman's "adhesive arrangement," by which part of the weight of the tender can be transferred to the engine.

The engine has been working very satisfactorily and takes the 4 o'clock train from Boston and New York, with six and seven cars, a distance of 99 miles, in 2 hours and 42 minutes, the maximum grades being 60 ft. per mile.

The striking thing about these engines is the high steam pressure which is carried. This is utilized by increasing the weight on the driving wheels. This latter is due to the

greater weight of the boiler, and also to the transfer of part of that of the tender by the appliance already referred to. The large number of tubes in a boiler of this size will also be noted. Mr. Underhill informs us that there has been no difficulty in carrying water or in working dry steam.

The weight of the engine is 80,000 lbs., 56,000 of which is on the driving wheels.

THE MISSISSIPPI RIVER GRAIN MOVEMENT continues insignificant and in strong contrast to what it was last year and the year before. The total river shipments this year to the end of April have been but 2,036,010 bushels, against 5,617,516 last year, a decrease of 64 per cent., though the river was not open until after the middle of February last year, and there has been no interruption to river navigation this year. Meanwhile the decrease in New Orleans receipts has been from 7,675,514 bushels in 1881 to 2,267,944 this year, or 70 per cent. The *barge* shipments down the Mississippi all go to New Orleans, but this year, we believe, but one tow of barges has gone down, and doubtless the larger part of the river shipments by the steamboats have been distributed on the way, the Southern demand being unusually large. The decrease in river shipments during the six weeks ending April 30 was from 4,225,683 bushels in 1881 to 617,172 this year, so that the decline is more marked recently than earlier in the season. Exports having fallen off so greatly, we should expect a large diminution of shipments to New Orleans, and in fact its total exports for the four months this year have been but 569,402 bushels—not equal to its receipts in many single weeks last year. But one would suppose that its loss in exports would be partly made good by the greatly increased Southern demand. This, however, can doubtless be supplied more economically, either by rail or river, by direct shipments from the North, as the interior demand in the East has long been supplied by direct shipments from the West, without the intervention of an Atlantic port as a distributing market.

THE GREAT WESTERN OF CANADA reports for the half year ending with January, which gives a little more railroad war than any other report yet published, January being too, probably the very worst month of all, some shipments of flour having been carried that month from Chicago to New York for 8 cents per 100 lbs., or, taking out the New York terminal of 3 cents, for just a trifle more than one tenth of a cent per ton per mile, at which rate the whole tremendous freight traffic of the New York Central last year would have earned but $2,650,000; instead of $20,736,000; and probably there was not much through eastbound freight in January at more than 10 and 12½ cents per 100 lbs. The Great Western directors estimate the loss of their company by the railroad war to have been $600,000, and as its gross earnings for the half-year were but $2,381,000, and its net earnings $648,000, this loss was a very serious one. Indeed it was four times as much as the total surplus revenue left for the common stock. Like other roads, it reports a large increase in working expenses, nearly 10 per cent., but its expenses per train-mile were nearly the same as last year (82½ cents against 83½). The decrease from $1.31½ to $1.12½ cents in earnings per train-mile is what caused the great decrease of $340,000 (30 per cent.) in net earnings. There was a decrease of $283,000 in freight earnings, and an increase of $90,000 in passenger earnings, the number of through passengers having been 19,000 greater than the year before.

APRIL EARNINGS, so far reported, show earnings per mile about the same as last year. Among the more important roads, the Central Pacific gains 9.6 per cent. in earnings, with 13 per cent. more road. Milwaukee & St. Paul gains nearly 20 per cent., with 12 per cent. more mileage; the Chicago & Northwestern gains 10¾ per cent., with 15 per cent. more miles; the St. Paul & Omaha gains 37 per cent., with 7 per cent. more road; the Denver & Rio Grande 29 per cent., with 54 per cent. more road; the Illinois Central gains 6 per cent. in Illinois, with no change in road, but loses 13 per cent. in Iowa; the Louisville & Nashville, with 10 per cent. more road, has 11½ per cent. more earnings; the Northern Pacific, with 35 per cent. more road, has 102½ per cent. more earnings; the Manitoba, a gain of 34 per cent. in earnings and 21 per cent. in road; the Union Pacific, nearly 40 per cent. in earnings and but 8 per cent. in road; the Wabash, 34⅜ per cent. in earnings and 35 per cent. in road. The most significant decrease is that of 11.8 per cent. on the Great Western of Canada; the Grand Trunk shows a slight decrease in spite of a large increase (53 per cent.) on the Chicago & Grand Trunk. The largest decrease is 31 per cent. on the main line of the St. Louis, Alton & Terre Haute, but the Hannibal & St. Joseph falls off 22 per cent. There are so many important roads yet to report that a general conclusion cannot yet be drawn.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings will be held as follows:

Illinois Central, annual meeting, at the office in Chicago, May 31. Transfer books close May 13.

Chicago, Rock Island & Pacific, annual meeting, at the office in Chicago, June 7. Transfer books close May 1.

Railroad Conventions.

The *Railway Car Accountants' Association* will hold its annual meeting in Boston, beginning on Tuesday, May 23, at 10 a. m. The Hotel Vendome has been selected as headquarters for members.

The *Master Car-Builders' Association* will meet in annual convention in Philadelphia, June 13.

The *Master Mechanics' Association* will hold its annual convention at Niagara Falls, beginning on June 20.

Dividends.

Dividends have been declared as follows:

Hanover Junction, Hanover & Gettysburg, 2 per cent., semi-annual, payable May 8.

Cleveland & Pittsburgh (leased to Pennsylvania Company), 1¾ per cent., quarterly, payable June 1.

North Pennsylvania (leased to Philadelphia & Reading), 1¾ per cent., quarterly, less 5 per cent. retained as a contingent fund.

New York, Providence & Boston, 2 per cent., payable May 10.

Foreclosure Sales.

The *Cleveland, Mt. Vernon & Delaware* road will be sold at Akron, O., June 7, by Wm. H. Upson, Special Commissioner, under the new decree of foreclosure. It will be remembered that the road was sold some time ago and bought in by the bondholders, who organized the Cleveland, Akron & Columbus Company. The decree of foreclosure was afterwards set aside on technical grounds and a new trial ordered, which has resulted in a new decree of foreclosure and sale.

Trunk Lines Advisory Commission.

The Advisory Commission began its sessions in the West at St. Louis, May 9, all the members being present, except Mr. Washburne, who was detained by sickness.

On the first day a sub-committee of the Merchants' Exchange of St. Louis submitted a report, taking no sides, but submitting facts and arguing that if *pro rata* freights were established instead of differential rates no difference should be made between St. Louis and Chicago. Mr. George Bain, President of the National Millers' Association, submitted a report advocating uniform rates and differential rates. Mr. Closser, of the Indianapolis Merchants' Exchange, submitted a report in favor of differential rates. The Commission made some inquiry as to the amount of grain and other shipments from St. Louis.

On May 10 the Commission heard the report of the committee of the Cotton Exchange. The Chairman said that the committee was divided in opinion, and agreed only on general principles. Mr. Webb M. Samuel, representing the grain trade, submitted a report concurring with the report made the previous day, and asked leave to file an additional amount of statistics. The Commissioners then adjourned, and on May 11 left for Louisville. From that city they will go to Toledo.

Passenger Pool Meeting.

In accordance with a resolution of the Joint Executive Committee, a meeting of managing officers and general passenger agents of all lines east of Chicago and north of the Ohio was to be held in Chicago, May 11, to further consider the agreement for division of passenger traffic. The following questions were to be considered:

"First—Whether the roads not represented at the meeting of April 26 and 27 will become parties to the agreement?

"Second—To agree upon the percentage of the division of traffic. For this purpose statements are submitted, showing the earnings of each road for the year 1881. The companies who do not think that the earnings for the year 1881 should be taken as the basis of division should submit their claim for increased percentages to the meeting to have it acted upon; or, in case of disagreement, submitted to arbitration."

Lake Shore & Michigan Southern Mutual Life Insurance Association.

The thirteenth annual meeting of this association was held in Cleveland, O., May 3, delegates being present from many points on the road.

President T. S. Lindsey made his annual address, setting forth the good condition and advantages of the association.

The Secretary's report showed receipts and expenses as follows:

Balance from previous year		$825.45
Assessments		4,893.75
New members		227.00
Interest		7.03
Total		$5,953.23
Losses	$4,457.67	
Salaries, commissions, etc	681.32	
		5,138.99
Balance on hand		$814.24

The election of officers and other business followed. Nothing but the usual routine business was transacted.

ELECTIONS AND APPOINTMENTS.

American Society of Civil Engineers.—At the regular meeting on May 3 the following were chosen members: Wm. G. Curtis, San Francisco; Edward C. Kinney, Des Moines, Ia.; Gustav Lindenthal, Pittsburgh, Pa.; Thomas C. McCollom, U. S. N., New London, Conn.; David Reeves (transferred), Philadelphia.

Atchison, Topeka & Santa Fe.—The following appointments are announced: G. Lockie, Road-Master, Douglas to Ellinwood, office at Newton, Kan.; J. M. Woodard, Road-Master, Florence to Kinsley, by McPherson cut off, office at Ellinwood, Kan.; S. Harpster, Road-Master, Kinsley to Kansas state line, office at Coolidge, Kan.

Baltimore & Ohio Leased Lines.—The following companies controlled by Baltimore & Ohio held their annual meetings in Pittsburgh, May 1, electing officers as follows: *Berlin.*—President, J. B. Washington; directors, Welty McCullogh, Robert Garrett, Joshua G. Harvey, W. H. Koontz S. A. Philson, S. Philson; Welty McCullogh, Secretary and Treasurer. *Brownsville & New Haven.*—President, J. B. Washington; directors, A. L. McFarlane, W. S. Kline, W. H. Markle, Welty McCullogh, A. O. Tintsman, Geo. Wilson; Welty McCullogh, Secretary and Treasurer. *Salisbury.*—President, Wm. S. Bissell; directors, W. M. Clements, S. Spencer, Robert Garrett, T. M. King, Johns McCleave, John B. Jackson, H. S. Burgesser, J. B. Caven; J. B. Washington, Secretary and Treasurer. *Somerset & Cambria.*—President, James B. Washington; directors, W. H. Koontz, C. C. Musselman, Welty McCullogh, D. J. Morrell, J. G. Harvey, Robert Garrett; Secretary, Welty McCullogh; Treasurer, W. H. Ijams.

Bangor & Portland.—At the annual meeting in Bangor, Pa., May 2, the following directors were chosen: C. Miller, G. W. Mackey, John I. Miller, John Buzzard, M. D., J. E. Long, Jonathan Moore, A. O. Allen. The new board elected the following officers: President, C. Miller; Secretary, G. W. Mackey; Treasurer, John I. Miller.

Boston, Hoosac Tunnel & Western.—The board has elected F. L. Ames President in place of Wm. L. Burt, deceased.

California Southern.—At the annual meeting, May 4, the following directors were chosen: Frank A. Kimball, Moses E. A. Luce, Thomas Nickerson, Thomas L. Rogers, Boston; Joseph O. Osgood, San Diego, Cal. The board elected Thomas Nickerson President; Thomas L. Rogers, Vice-President; S. W. Reynolds, Treasurer and Assistant Secretary; J. H. Goodspeed, Auditor; Frank H. Pattee, Secretary; H. E. Cooper, Attorney; Joseph O. Osgood, Chief Engineer. The offices of the Attorney and Chief Engineer are in San Diego, Cal., the other offices are in Boston.

Canadian Pacific.—The office of Mr. Archer Baker, General Superintendent of the Eastern Division, was removed from Ottawa to Montreal on May 8.

Central Pacific.—A number of changes, chiefly promotions, have been made in the management of this road; the new appointments are as follows: General Manager, A. N. Towne, heretofore General Superintendent; General Superintendent, J. A. Fillmore, late Assistant General Superintendent; Assistant General Superintendent, R. H. Pratt, late Superintendent of the Sacramento and Oregon divisions; General Traffic Manager, J. C. Stubbs, late General Freight Agent; General Freight Agent, Richard Gray, late Assistant.

The offices of General Manager and General Traffic Manager are new on this road. It is understood that President Stanford means to transfer some of the active duties of his position to the General Manager.

Chicago, Burlington & Quincy.—Mr. A. J. Spurr has been appointed Train-Master of the Chicago Division, with office in Aurora, Ill., in place of S. E. Crance, promoted to be Superintendent of the St. Louis Division.

Mr. C. B. Sauer is appointed Train Dispatcher and Chief Operator of the Middle Iowa Division, with office at Ottumwa, Ia., in place of G. E. Simpson, who has gone to the Chicago, Milwaukee & St. Paul.

Chicago & Eastern Illinois.—Mr. H. A. Rubidge is appointed Auditor in place of A. S. Dunham, resigned.

Chicago, Milwaukee & St. Paul.—Mr. G. E. Simpson is appointed Superintendent of Telegraph, with charge of all the telegraph lines of the company. Office in Milwaukee.

Chicago, Portage & Superior.—At a meeting of the board in Chicago, April 29, the following directors were chosen to fill vacancies made by resignations: C. Lynde, Rock Island, Ill.; M. A. Fair, C. M. Osborn, W. G. Purdy, Thomas F. Withrow, Chicago. The board elected Thomas F. Withrow President. Mr. Withrow is General Counsel for the Chicago, Rock Island & Pacific Company.

Chicago & Western Indiana.—Mr. Roswell Miller has been chosen Second Vice-President and Treasurer.

Cincinnati, Hamilton & Dayton.—Mr. J. H. Barrett is Superintendent of all the lines worked by this company, including the Cincinnati, Hamilton & Dayton, the Cincinnati, Richmond & Chicago, the Cincinnati, Hamilton & Indianapolis and the Dayton & Michigan.

Cincinnati, Wabash & Michigan.—Mr. J. H. Craig has been appointed Auditor, with office at Elkhart, Ind.

Columbus, Hocking Valley & Toledo.—Mr. J. D. Lott is appointed Auditor in place of T. J. Janney, resigned. Mr. W. N. Cott succeeds Mr. Lott as Paymaster.

Davenport, Iowa & Dakota.—The directors of this new company have elected officers as follows: President, H. M. Martin, Davenport, Ia.; Vice-President, H. W. Bailey, Tipton, Ia.; Secretary, H. C. Fulton, Davenport, Ia.; Treasurer, J. S. Stacey, Anamosa, Ia.

Delaware & Hudson Canal.—At the annual meeting in New York, May 9, the following directors were chosen: John Jacob Astor, Legrand B. Cannon, David Dows, James M. Halstead, Adolphus Hamilton, Robert S. Hone, Hugh J. Jewett, Abiel A. Low, James Roosevelt, James R. Taylor, Abraham R. Van Nest, New York; Thomas Cornell, Kingston, N. Y.; Thomas Dickson, Scranton, Pa. The board re-elected Thomas Dickson President.

Duluth & Iron Range.—The directors of this company are: C. P. Bailey, B. Culver, J. D. Ensign, George C. Stone, H. F. Thompson, Duluth, Minn.; T. L. Blood, St. Paul, Minn.; R. R. Lee, Charlemagne Tower, Charlemagne Tower, Jr., Philadelphia. The board has elected George C. Stone President; H. F. Thompson, Secretary and Treasurer; R. R. Lee, Chief Engineer.

East Tennessee, Virginia & Georgia.—Mr. J. F. Mallory has been appointed Superintendent of the Macon & Brunswick Division, in place of J. M. Edwards, resigned. Mr. Mallory was formerly Superintendent of the Western Division of the Chesapeake & Ohio road.

Indiana, Bloomington & Western.—At the annual meeting in Indianapolis, Ind., May 9, the following directors were chosen: James D. Campbell, Austin Corbin, Joseph Dodd, Robert K. Dow, Frederick W. Dunton, John L. Farwell, Charles Hanford, Benjamin S. Henning, Alfred Lilly, George F. Leighton, S. Rogers Maxwell, Henry W. Maxwell, F. W. Peck. Messrs. Campbell, Dodd, Hanford and Leighton are new directors.

Lake Shore & Michigan Southern.—The new board elected Wm. H. Vanderbilt President; Augustus Schell, Vice-President; John Newell, General Manager; Addison Hills, Assistant General Manager; E. D. Worcester, Secretary and Treasurer; N. Bartlett, Assistant Secretary and Assistant Treasurer; Ashley Pond, General Counsel. The only change is the election of Mr. Pond as General Counsel in place of Mr. James Mason, of Cleveland.

Lake Shore & Michigan Southern United Life Insurance Association.—At the annual meeting, May 3, the following directors were chosen: D. Morrisey, Elkhart, Ind.; John Townsend, Adrian, Mich.; C. Close, Norwalk, O.; O. Hayward, R. H. Hill, George Pattison, James Raben, L. Stiles, Cleveland, O.; J. C. Hart, Erie, Pa.; W. W. Buffum, J. F. Lane, Buffalo, N. Y. The board elected T. S. Lindsey President; E. C. Luce, Vice-President; G. W. Crossette, Secretary and Treasurer; O. C. Getzen-Danner, Attorney and Counsel.

Louisiana & Missouri River.—At the annual meeting in St. Louis, May 3, the following were chosen: President, C. Beckwith; directors, H. V. P. Block, J. J. Mitchell, W. H. Mitchell, J. P. Sebree, George Straut, R. P. Tansey; Secretary and Treasurer; C. H. Foster, Assistant Secretary, A. de Figretto. The road is leased to the Chicago & Alton Company.

Memphis, Selma & Brunswick.—At the annual meeting April 28, the following directors were chosen: J. J. Busby, Memphis, Tenn.; W. S. Featherston, Holly Springs, Miss; J. M. Billups, Columbus, Miss.; E. O. Sykes, Aberdeen, Miss.; J. R. McIntosh, Okolona, Miss.; Frederick Wolffe, Montgomery, Ala.; Charles E. Lewis, Otto Plock, J. N. Seligman, New York. The board elected Frederick Wolfe President; J. J. Busby, Vice-President; Max Cain, Secretary and Treasurer; J. C. Griffin, Assistant Secretary and Assistant Treasurer; Minor Meriwether, Attorney.

Mexican Central.—Mr. Frederick L. Parker has been appointed General Freight and Passenger Agent. He has been connected with the Central Vermont and the Fitchburg roads and has been recently Assistant to the President of the Atchison, Topeka & Santa Fe.

Minneapolis & St. Louis.—The board as reorganized has elected R. R. Cable President in place of W. D. Washburn, resigned.

Nantasket Beach.—At the annual meeting in Boston last week the following directors were chosen: John L. Curtis, George R. Eager, W. H. Hill, Jr., J. B. Moores, R. M. Pulsifer.

Natchez, Jackson & Columbus.—Mr. Owen Meriwether, of Memphis, Tenn., is Engineer in charge of constructions.

New York & Atlantic.—The directors of this company are: Rastus S. Ransom, Arthur D. Vinton, David M. Yeomans, Moses Taylor Pine, James Jourdan, Frank Butterworth, Edward Schell, John C. Mills, Jesse Johnson, James Cheever, Edward A. Quintard, Lemuel H. Wilson, Samuel B. Dick. Mr. David M. Yeomans is President.

New York, Ontario & Western.—Mr. C. C. Lovejoy has been appointed Superintendent of Bridges and Buildings. Mr. Lovejoy has recently had charge of the works on the New York side of the Hudson River Tunnel.

New York Stock Exchange.—At the annual meeting, May 8, the following officers were chosen for the ensuing year: President, F. N. Lawrence; Chairman, James Mitchell; Vice-Chairman, Alexander Henriques; Secretary, B. O. White; Treasurer, D. C. Hays; Trustee of Gratuity Fund, James M. Fuller; Governing Committee, for four years, Donald Mackay, Henry Meigs, A. Wolff, Jr., Clarence S. Day, Nelson Robinson, Rudolph Keppler, Wm. Adams, Thomas Denny, James D. Smith, N. W. T. Hatch; for two years, to fill vacancy, W. A. Bowron; for one year, to fill vacancy, Charles M. Stead.

New York, Susquehanna & Western.—At the annual meeting last week the following directors were chosen: G. A. Hobart, Paterson, N. J.; Charles Siedler, Jersey City, N. J.; R. F. McCabe, Scranton, Pa.; R. K. Dow, Claremont, N. H.; Isaac T. Burr, Boston; Simon Borg, Wm. S. Dunn, John L. Farwell, A. D. Juillard, Henry Marks, Charles Minzesheimer, F. A. Potts, J. S. Rogers, New York. The new directors are Messrs. Burr and Farwell, who succeed A. L. Lee and W. O. McDowell. The board elected F. A. Potts President; J. P. Rafferty, Secretary; R. T. Chapel, Treasurer.

Ohio Central.—Mr. John E. Martin has been appointed General Superintendent. He was formerly President and Superintendent of the Evansville & Terre Haute road.

Oregon & California.—At the annual meeting in Portland, Or., April 25, the following officers were chosen: President, Henry Villard; Vice-President, Richard Koehler; Second Vice-President, J. N. Dolph; Secretary and Treasurer, George H. Andrews; Assistant Secretary, H. H. Wyndale, New York; Assistant Treasurer, Anthony I. Thomas, New York.

Oregon Railway & Navigation Co.—Mr. J. M. Fillmore has been appointed Superintendent of the Railroad Division of this company's lines. He was formerly Superintendent of the North Pacific Coast road, and more recently of the Oregonian Railway.

Pennsylvania Railroad Leased Lines.—At the annual meetings held this week the following officers were chosen for leased lines in New Jersey:

Pemberton & Sea-shore.—Directors, Strickland Kneass, E. T. Green, Edmund Smith, Wistar Morris, W. P. Shortridge, Henry M. Phillips, Henry D. Welsh, John P. Wetherill, A. M. Fox, W. L. Elkins, H. H. Houston, G. M. Dorrance, J. S. Buckelew; President, Strickland Kneass; Secretary and Treasurer, James R. McClure; Transfer Agent, R. D. Keen. *Freehold & Jamesburg Agricultural.*—Directors, Strickland Kneass, Edmund Smith, J. S. Buckelew, Lewis Perrine, S. B. Oviatt, Hal. Allaire, Jacob B. Rue, Alexander M. Fox, Henry D. Welsh, Clifford Stanley Sims, James R. McClure; President, Strickland Kneass; Secretary, James R. McClure; Treasurer, W. Taylor; Transfer Agent, R. D. Keen. *Philadelphia & Long Branch.*—Directors, W. L. Dennis, Warren E. Dennis, E. W. Jackson, C. B. Thurston, W. J. Sewell, J. S. Buckelew, G. B. Roberts, Edmund Smith, Strickland Kneass, G. M. Dorrance, A. M. Fox, Henry D. Welsh, Robert E. Pettit; President, G. M. Dorrance; Secretary, James R. McClure; Treasurer, W. Taylor; Transfer Agent, R. N. Keen.

The following were chosen officers of leased and controlled companies at meetings held in Philadelphia, May 1: *Chartiers.*—President, G. B. Roberts; directors, Alexander Biddle, J. N. DuBarry, S. M. Felton, Strickland Kneass, Wistar Morris, N. Parker Shortridge. *Sunbury & Lewistown*—President, Aaron Fries; directors, James H. Campbell, Josiah Hart, Samuel G. Lewis, John W. Moffly, Geo. Shannon, Stephen Green. *Tyrone & Clearfield.*—President, J. N. DuBarry; directors, Strickland Kneass, Wistar Morris, Henry M. Phillips, G. B. Roberts, N. P. Shortridge, Edmund Smith. *Shamokin Valley & Pottsville.*—President, G. B. Roberts; managers, Wistar Morris, J. N. DuBarry, Jacob P. Jones, A. J. Cassatt, Edmund Smith, John Green; Secretary, Stephen W. White. *Sunbury, Hazleton & Wilkesbarre.*—President, J. N. DuBarry; directors, D. B. Cummings, Wistar Morris, H. M. Phillips, G. B. Roberts, Edmund Smith, J. Price Wetherill. *Pomeroy & Newark.*—Directors, Strickland Kneass, Edmund Smith, J. N. DuBarry, John P. Wetherill, Henry D. Welch, Wistar Morris, S. M. Felton; Secretary and Treasurer, James R. McClure. *East Brandywine & Waynesburg.*—President, John Cornog; directors, William M. Morton, T. M. Storb, Amos Diller, Strickland Kneass, B. F. Kinzer, J. N. DuBarry, S. M. Felton, Wistar Morris, G. M. Roberts, James R. McClure, Edmund Smith, N. P. Shortridge. *Lewisburg & Tyrone.*—President Strickland Kneass; directors, G. B. Roberts, Edmund Smith, Wistar Morris, Eli Stifer, James P. Coburn, Samuel C. Stewart: James R. McClure, Secretary and Treasurer.

Pleasantville & Ocean City.—At a recent meeting in Camden, N. J., the following officers were chosen: President, George Wood; directors, Israel G. Adams, Israel S Adams, Strickland Kneass, John Moore, George B. Roberts, Wm. Robinson, Wm. J. Sewell, N. Parker Shortridge, Charles P. Stratton, Walter Wood; Secretary, Edwin Bettle. The road is now controlled by the Pennsylvania.

Port Huron & Southwestern.—The following officers have been chosen: President, John P. Sanborn; Secretary and Treasurer, F. L. Wells; Manager, H. McMorran.

Rochester & Irondequoit.—At the annual meeting in Rochester, N. Y., May 8, the following directors were chosen: Wm. Emerson, T. A. Summers, Wm. H. Crennell, H. J. Taylor, P. B. Hulett, B. W. Tone, Wm. C. Bush, A. J. Armstrong, Simon Stettheimer, H. F. Shoemaker, Wm. Purcell, B. F. Simpson, Mortimer Wilkie.

Sabine & East Texas.—Mr. John B. Morford is appointed General Superintendent, with office at Beaumont, Tex., in place of R. H. Cousins, who remains on the road as Chief Engineer.

Saginaw, Tuscola & Huron.—The officers are: W. L. Webber, President; E. T. Judd, Secretary and Treasurer; C. S. McMillan, Superintendent. Offices at East Saginaw, Mich.

St. Louis, Council Bluffs & Omaha.—At the annual meeting in St. Louis last week the following directors were chosen: John R. Lionberger, John Jackson, G. B. Allen, Wm. Taussig, Julius Walsh, A. L. Hopkins, Robert Andrews, Thomas E. Tutt, James Cheney, James F. Howe, B. W. Lewis, Solon Humphreys, O. D. Ashley. The road is worked by the Wabash, St. Louis & Pacific.

St. Louis, Iron Mountain & Southern.—Mr. Wilson Garrison is appointed Master Mechanic in charge of the shops at Texarkana, which are used both by this road and the Texas & Pacific. Mr. Thomas Ormerod continues Foreman of the locomotive shops and Mr. W. J. Arthur Foreman of the car shops.

St. Paul, Minneapolis & Manitoba.—The following circulars from General Manager A. Manvel are dated St. Paul, Minn., May 1:

"Mr. E. B. Wakeman is this day appointed Assistant General Superintendent of the line, with headquarters at St. Paul. He will still perform the duties assigned to him as Superintendent of Transportation, and will, in addition, have general charge of the train and station service, and his orders will be respected accordingly."

"Mr. C. O. Wheeler having resigned as Superintendent of Northern Division, Mr. D. K. Smith is appointed Division Superintendent, with headquarters at Crookston, and will have charge of the lines north of Fergus Falls, including the line from Breckenridge to Barnesville. Mr. E. J. Evans is appointed Assistant Superintendent of Northern Division, with headquarters at Fergus Falls. Resignation and appointments in effect from this date."

San Francisco & North Pacific.—Mr. Charles Thorn, Jr., is appointed General Freight Agent in place of W. D. Mason.

Savannah, Florida & Western.—The following circulars from this company are dated Savannah, May 1:

"W. B. McKee is hereby appointed Comptroller.

"A. A. Aveilhé is hereby appointed Purchasing Agent, vice W. B. McKee, appointed Comptroller."

Schuylkill & Lehigh.—At the annual meeting in Philadelphia, May 1, the following were chosen: President, J. N. Hutchinson; directors, G. A. Nicholls, G. DeB. Keim, George F. Baer, George D. Stitzel, H. S. Eckert, Moses K. Graeff; Secretary, J. Y. Humphrey; Treasurer, R. B. Kinsey. The road is controlled by the Philadelphia & Reading Company.

Seaboard & Roanoke.—At the annual meeting in Norfolk, Va., last week, the following were chosen: President, John M. Robinson; directors, D. A. Barnes, Richard Dickson, Nalbro Frazier, R. C. Hoffman, Moncure Robinson, Jr., Enoch Pratt.

Shenandoah Valley.—At the annual meeting in Front Royal, Va., May 3, the old board was re-elected, except that John F. Bullitt, of Philadelphia, was substituted for Joseph T. Wright. The board re-elected F. J. Kimball President; U. L. Boyce, Vice-President; G. R. W. Armes, Secretary; Wm. G. Macdowell, Treasurer; Joseph H. Sands, Superintendent; Charles P. Hatch, General Freight and Passenger Agent; J. W. Cox, Auditor and General Ticket Agent.

South Carolina.—The present board of directors is as follows: Wm. H. Brawley, Andrew Simonds, Charleston, S. C.; Frederick Hardy, James J. Higginson, T. Bailey Myers, Percy R. Pyne, Samuel Sloan, Francis A. Stout, Henry P. Talmadge, New York. Mr. Henry P. Talmadge is President.

Tennessee & Sequatchie Valley.—Mr. Charles Clinton is to be General Manager.

Texas & St. Louis.—The officers of this road are now as follows: General Superintendent, J. B. Van Dyne; Auditor, H. G. Askew; General Freight and Passenger Agent, George W. Lilley; Chief Engineer, C. F. Stephens.

Toledo, Cincinnati & St. Louis.—Mr. T. H. Beale has been appointed General Freight and Passenger Agent, with office in Toledo, O., in place of T. W. Lippincott, resigned.

Mr. C. C. Clarke has been appointed Superintendent of the Iron Division, with office at Ironton, O. This division was formerly the Iron Railroad.

Wilmington & Northern.—At the annual meeting in Coatesville, Pa., May 1, the following directors were chosen: George Brooke, H. I. Dupont, Richard E. Ely, A. L. Foster, John S. Gerhard, Charles Huston, Charles Wheeler. The board re-elected H. I. Dupont, President; P. S. Ermold, Secretary and Treasurer; J. H. Thompson, General Superintendent and Engineer.

PERSONAL.

—Mr. C. C. Church has resigned his position as General Agent at Kansas City for the Southwestern Railway Association.

—Mr. J. S. Noble has resigned his position as Superintendent of the Transcontinental Division of the Texas & Pacific road.

Mr. C. O. Wheeler has resigned his position as Superintendent of the Northern Division of the St. Paul, Minneapolis & Manitoba road.

—Mr. S. M. Manifold has resigned his position as Superintendent of the York & Peachbottom Railroad. He has been connected with the road almost from its first beginning.

—The Chicago *Tribune* says that Gen. John M. Corse, President of the Toledo, Cincinnati & St. Louis Railroad Company, and the hero of Allatoona Pass, will be married June 22 next at Winchester, Mass., to Miss Frances McNeil.

—Col. Edward B. White died at his residence in New York, May 10, aged 76 years. Col. While was a graduate of West Point and served several years in the army, afterwards settling in Charleston, S. C. He was engineer in charge of the construction of the Northwestern and the Chevan & Darlington roads, but afterwards turned his attention chiefly to architecture. He removed to New York several years ago.

TRAFFIC AND EARNINGS.

Chicago Lumber Traffic.

Receipts and shipments of lumber at Chicago, Jan 1 to May 4, have been:

	1882.	1881.	Increase.	P. c.
Receipts	267,442,000	116,054,000	151,388,000	130.0
Shipments	592,307,000	362,613,000	229,694,000	63.3

The vast increase in receipts may be accounted for by the fact that Lake Michigan was open nearly every month this year, and shipments on it were active after February, while last year it was nearly May before much could be done. This, however, does not account for the increase of shipments from Chicago. Doubtless the severe weather last year reduced the winter demand and the ability of the railroads to carry lumber at the same time, but hardly to the extent shown above.

Railroad Earnings.

Earnings for various periods are reported as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Four months ending April 30:				
Bur., Ced. Rap. & No.	$880,804	$625,490	I. $255,374	40.9
Central Pacific	7,599,144	6,639,132	I. 960,012	14.4
Chi. & Eastern Ill.	538,782	498,282	I. 40,500	8 1
Chi., Mil. & St. P.	5,891,000	3,850,499	I. 2,040,501	53.0
Chi. & Northwest.	6,423,666	4,857,278	I. 1,566,388	32.3
Cleve., Ak. & Col.	149,035	132,841	I. 16,194	12.2
Det., Lan. & No.	497,004	380,103	I. 116,901	30.7
Great Western	1,584,168	1,727,924	D. 143,756	8.3
Hann. & St. Jo.	596,003	644,443	D. 48,440	7.5
Ill. Central, Ill. lines.	2,189,621	1,908,829	I. 280,792	14.7
Iowa lines	597,913	467,233	I. 130,680	28.2
Ind., Bloom. & West.	783,748	746,738	I. 37,010	4.9
Kan. City, Ft. S. & G.	557,556	484,413	I. 73,143	15.1
Lake Erie & West.	432,127	394,988	I. 37,139	9.4
Long Island	53[illegible],569	477,504	I. 58,065	12.1
Louisv. & Nash.	3,949,849	3,420,905	I. 528,944	15.5
Mo. Pacific lines:				
Central Branch	268,529	279,927	D. 11,398	4.1
Int. & Gt. No.	868,934	799,518	I. 69,416	8.7
Mo., Kan. & Tex.	1,711,080	1,494,862	I. 216,218	14.5
Mo. Pacific	2,118,980	1,835,637	I. 283,343	15.4
St. L., I. M. & So.	2,184,482	2,384,648	D. 199,566	8.4
Texas & Pac	1,258,883	1,156,951	I. 101,932	8.8
Mobile & Ohio	617,510	835,579	D. 218,069	26.1
Northern Pacific	1,330,800	574,505	I. 756,295	131.7
St. L., A. & T. H.—				
Main Line	395,377	472,312	D. 76,935	16.3
Belleville Line	259,424	268,009	D. 8,585	3.2
St. L. & San Fran.	1,019,204	918,018	I. 101,186	11.0
St. P., Minn & Man.	1,915,713	1,160,317	I. 755,396	63.2
Scioto Valley	148,936	98,900	I. 50,036	5.0
Tol., Cin. & St. L.	292,478	181,665	I. 110,813	60.9
Union Pacific	8,409,787	6,220,354	I. 2,189,433	35.2
Wabash, St. L. & P.	5,058,702	3,775,613	I. 1,283,089	34.0
Three months ending March 31:				
Eastern	$686,733	$629,342	I. $57,391	9.1
Eur. & No. American	118,805	103,831	I. 14,974	14.4
Utah Central	360,497	.....	.....	.....
Net earnings	209,363	.....	.....	.....
Month of March:				
Eastern	$255,890	$238,594	I. $17,296	7.2
Eur. & No. American	47,132	41,505	I. 5,627	13.6
Utah Central	121,026	.....	.....	.....
Month of April:				
Bur., Ced. Rap. & No.	$178,304	$184,680	D. $6,376	3.4
Central Pacific	2,052,000	1,872,370	I. 179,630	9.6
Chi. & Eastern Ill.	126,284	134,070	D. 7,786	5.8
Chi. & Gd. Trunk	194,122	126,760	I. 67,362	52.0
Chi., Mil. & St. P.	1,578,000	1,259,946	I. 258,054	20.5
Chi. & Northwest	1,634,819	1,474,611	I. 160,208	10.8
Cleve., Ak. & Col.	39,874	35,353	I. 4,521	12.9
Col., H. Vy. & Tol.	231,937	189,667	I. 42,270	22.3
Det., Lan. & No.	129,056	111,426	I. 17,630	15.9
Hann. & St. Jo.	148,913	190,812	D. 41,899	21.9
Ill. Central, Ill. lines.	536,408	503,754	I. 32,674	6.5
Iowa lines	138,195	158,759	D. 20,564	13 0
Ind., Bloom. & West.	205,934	203,677	I. 2,257	1.1
Kan. City, Ft. S. & G.	151,463	162,185	D. 10,722	6.7
Lake Erie & West.	112,071	106 398	I. 5,673	5.3
Long Island	157,736	142,995	I. 14,741	10.2
Louis. & Nash.	950,007	850,862	I. 99,145	11.6
Mo. Pacific lines:				
Central Branch	59,371	87,134	D. 27,763	31.9
Int. & Gt. No.	229,145	183,482	I. 45,663	25.0
Mo., Kan. & Tex.	444,195	393,445	I. 50,750	12.9
Mo. Pacific	541,142	537,561	I. 3,581	0.7
St. L., I. M. & So.	581,977	548,300	I. 33,677	6.1
Texas & Pacific	359,543	295,066	I. 64,477	21.8
Mobile & Ohio	145,272	163,550	D. 18,278	11.1
Northern Pacific	438,000	216,210	I. 221,790	102.7
Ohio Southern	29,040	24,662	I. 4,378	17.7
St. L., A. & T. H.				
Main Line	91,507	133,337	D. 41,830	31.4
Belleville Line	65,943	64,110	I. 1,833	2.9
St. L. & San Fran.	242,806	265,298	D. 22,492	8.5
St. P., Minn. & Man.	570,890	425,685	I. 145,205	34.2
Scioto Valley	40,867	26,407	I. 14,460	55.5
Tol., Cin. & St. L.	76,626	47,501	I. 29,125	61.3
Union Pacific	2,462,704	1,766,894	I. 695,110	39.3
Wabash, St. L. & P.	1,378,194	1,023,482	I. 354,712	34.7
First week in May:				
Denver & R. G.	$135,930	$111,673	I. $24,257	21.7

For a number of the figures given above we are indebted to the *Commercial and Financial Chronicle.*

Coal Movement.

Anthracite tonnages for the four months ending April 29 are reported as follows, the tonnage in each case being only that originating on the line to which it is credited:

	1882.	1881.	Inc. or Dec.	P. c.
Phila. & Reading	1,801,552	1,809,013	D. 7,461	0.4
Nor. Central, Shamokin Div., and Summit Br. R. R.	320,951	313,167	I. 7,784	2.5
Sunbury, Hazleton & Wilkesbarre	12,273	1,666	I. 10,607	636.4
Pennsylvania Canal	46,422	34,858	I. 11,564	33.0
Cen. of N. J., Lehigh Div.	1,284,305	1,303,330	D. 19,025	1.5
Lehigh Valley	1,597,610	1,654,679	D. 57,069	3.5
Pennsylvania & N. Y.	57,348	21,339	I. 36,009	164.6
Del., Lacka. & Western	1,224,823	1,256,898	D. 32,075	2.5
Del. & Hudson Canal Co.	974,232	1,091,662	D. 117,430	10.8
Pennsylvania Coal Co.	320,703	347,460	D. 26,757	7.7
State Line & Sullivan	15,941	18,868	D. 3,927	19.7
Total anthracite	7,656,160	7,853,940	D. 197,780	2.5

The tonnage of anthracite for the corresponding period for six years has been:

1882	7,656,160	1879	7,021,164
1881	7,853,940	1878	4,100,651
1880	6,753,492	1877	5,752,446

Anthracite trade continues extremely dull, and prices are very weak, though the companies make a show of maintaining them. The production still appears to be too great for the demand.

The anthracite coal tonnage of the Belvidere Division Pennsylvania Railroad, for the four months was as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Coal Port for shipment	8,456	7,179	I. 1,277	17.7
S. Amboy for shipment	236,647	207,611	I. 29,036	13.9
Local points on N. J. lines	224,119	245,832	D. 21,713	8.8
Co.'s use on N. J. lines	43,892	35,291	I. 8,601	24.5
Total	513,114	495,913	I. 17,201	3.5

Of the total this year 397,615 tons were from the Lehigh Region and 115,499 tons from the Wyoming Region.

Actual tonnage of coal passing over the Pennsylvania & New York road for the five months of its fiscal year from Dec. 1 to April 29 was:

	1882.	1881.	Inc. or Dec.	P. c.
Anthracite	408,071	347,082	I. 60,989	17.9
Bituminous	167,665	183,028	D. 15,363	8.4
Total	575,736	530,110	I. 45,626	8.6

Semi-bituminous tonnages reported for the four months are as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Cumberland	465,305	515,807	D. 50,502	9.8
Huntingdon & Broad Top	82,373	80,677	I. 1,696	2.1
East Broad Top	33,065	23,448	I. 9,617	41.1
Tyrone & Clearfield	906,682	742,744	I. 163,938	22.1
Bellefonte & Snow Shoe	67,897	28,735	I. 39,162	136.4
Total semi-bituminous	1,555,322	1,391,411	I. 163,911	11.8

Clearfield production is very large this year. The Cum-

berland output is still stopped by the strike, and there is no apparent prospect of a resumption of work.

Actual tonnage passing over the Huntingdon & Broad Top road for the four months was:

	1882.	1881.	Increase.	P. c.
Broad Top coal	82,373	80,677	1,696	2.1
Cumberland coal	85,330	63,426	21,904	34.5
Total	167,703	144,103	23,600	16.4

The Broad Top coal is mined on the line; the Cumberland carried through for the Pennsylvania Railroad.

Shipments of Cumberland coal away from the region for the four months were as follows:

	1882.	1881.	Inc. or Dec.	P.c.
By Balt. & Ohio R. R	387,309	427,047	D. 39,738	9.1
By Bedford Div., Pa. R. R.	74,842	53,278	I. 21,564	40 4
By Cues. & Ohio Canal	4,558	43,765	D. 39,207	89.5
Total	466,709	524,090	D. 57,381	10.9

Of the coal carried from the mines to Cumberland this year, the George's Creek & Cumberland road has carried 48,275 tons, or 10.3 per cent.

Bituminous tonnages reported for the four months are as follows:

	1882.	1881.	Inc. or Dec.	P. c.
Barclay R. R. & Coal Co.	131,717	145,732	D. 14,015	9 6
Pa. R. R., Allegheny Region	165,061	93,953	I. 72,1 8	77.5
Penn and Westmoreland	40 ,900	277,605	I. 131,355	4 5.
West Penna. R. R	117,255	112,636	I. 4,619	4.1
Southwest Penna. R. R.	18,218	11,120	I. 7,098	63.8
Pittsburgh Region, Pa. R.R.	228,6 1	216,139	I. 12,462	5.
Total bituminous	1,069,812	856,185	I. 213,627	24.9

Bituminous trade shows a general improvement, with some local drawbacks. It is stated that the shipments from the bituminous regions of Northwestern Pennsylvania show a heavy increase this year; but we have no definite figures.

Coke tonnages reported for the four months are as follows:

	1882.	1881.	Increase.	P. c.
Bellefonte & Snow Shoe	8,005	2,777	5,228	181.1
Allegheny Region, Pa. R. R.	36,573	33,777	2,796	8 2
Penn and Westmoreland	92,039	67,229	24,810	37.6
West Penna. R. R	42,723	38,652	4,071	10.5
Southwest Penna. R. R.	612,126	495,548	116,578	23.6
Pittsburgh Region, Pa. R. R.	244,519	205,194	39,325	19.2
Total coke	1,035,985	843,177	192,808	22.9

Coke traffic shows a steady increase. The tonnages given above all for the Pennsylvania Railroad and branches. No definite figures are published for the river trade from Pittsburgh, which is very large.

The coal tonnage of the Pennsylvania Railroad (main line and branches in Pennsylvania) for the four months ending April 29, was as follows:

	1882.	1881.	Increase.	P. c.
Anthracite	469,222	456,894	12,328	2.7
Semi-bituminous	1,150,581	902,458	248,123	27.5
Bituminous	938,095	710,453	227,642	32.1
Coke	1,035,985	843,177	192,808	22.9
Total	3,593,883	2,912,982	680.901	23.4

The increase this year is very large. The tonnages for January of this year were 810,571; February, 823,788; March, 1,114,894; April, 844,630; total, 3,593,883 tons.

Coal shipments from the mines about Rich Hill, Mo., in March, were: By Missouri Pacific, 1,036 car-loads; by Kansas City, Ft. Scott & Gulf, 763 car-loads; total, 1,799 car-loads, or about 29,580 tons.

During the month of April the Tennessee Coal, Iron & Railroad Co. shipped over its road from Tracy City, Tenn., 11,022 tons of coal and 9,506 tons of coke. Total shipments to April 30 were 48,643 tons of coal and 39,367 tons of coke.

Southern Railway & Steamship Association.

The following circular to members has been issued by General Commissioner Powers, under date of May 5:

"On Jan. 16 I issued Circular Letter No. 20, in reference to the adoption of uniform form of bills of lading by all lines, members of, or working with the Association.

"Accompanying that circular I sent you several copies of each form of the bill of lading proposed by the Rate Committee, and requested the return of one of each form with your approval or dissent indorsed on the same. So far I have received but very few replies.

"Please refer to Circular Letter No. 20, Series 1881-82, and the forms accompanying the same, and advise me as early as possible whether you approve or disapprove the forms. Note remarks in circular in reference to fire clause and in reference to the time allowed for removal of freights.

"It is necessary, if the forms are adopted, that they should be in use sometime before the opening of the busy season. Hence the necessity for an early reply."

Grain Movement.

For the week ending April 29, receipts and shipments of grain of all kinds at the eight reporting Northwestern markets and receipts at the seven Atlantics ports have been, in bushels, for the past six years:

Year.	Northwestern receipts.	Northwestern shipments. Total.	By rail.	P. c. by rail.	Atlantic receipts.
1877	3,396,193	4,521,713	1,341,677	29.7	2,196,090
1878	4,844,507	4,591,346	1,056,155	23.0	3,090,700
1879	4,297,006	4,558,360	2,931,082	64.3	4,023,227
1880	3,750,407	4,361,732	1,159,369	26.6	4,424,936
1881	4,184,871	3,778,676	3,069,926	81.3	5,181,750
1882	3,993,043	3,463,298	1,398,757	40.4	1,906,570

The receipts of the Northwestern markets, though smaller than in the corresponding weeks of 1881, 1879 and 1878, were still very large—10 per cent. larger than the week before, and the largest since last October. The shipments of these markets were smaller than in any corresponding year since 1875 and a trifle less than the week before, but with that exception they were the largest since Nov. 12, last. The *rail* shipments were larger than in the corresponding week of any previous when navigation was open except 1876, when it was the first week of the great railroad war of that year. This year 126,544 bushels went down the Mississippi. The Atlantic receipts were smaller than in any corresponding week for nine years at least, and 3,275,000 bushels (63 per cent.) less than last year. They were a little larger than the week before, however, and the largest for ten weeks.

Of the Northwestern receipts, Chicago had 43.5 per cent., St. Louis 17.1, Peoria 12.7, Toledo 12, Detroit 6.7, Milwaukee 5.1, Cleveland 2.6, and Duluth 0.3 per cent. The gains of the week are at lake ports: St. Louis and Peoria lose.

Of the Atlantic receipts New York had 50.3 per cent., Boston 17.5, Philadelphia 15.4, Baltimore 9.6, New Orleans 5 6, Portland 1.3 and Montreal 0.3 per cent. Compared with the previous week New York, Boston and Baltimore gain, Philadelphia and New Orleans lose. It was during this week that there were the first receipts at New York by canal.

The exports of the week were 903,842 bushels, of which 68.8 per cent. went from New York, 16.9 from Baltimore, 7.1 from Philadelphia, 5.7 from Boston, 1.5 from Portland and 98 *bushels* from New Orleans. The exports for the week ending May 2 were 781,877 bushels of grain and 36,395 barrels of flour, against 2,397,558 bushels of grain and 104,271 barrels of flour in the corresponding week, and 3,665,175 bushels of grain and 96,391 barrels of flour in the corresponding week of 1880.

For the two weeks ending May 6 receipts and shipments at Buffalo were:

	Receipts.	Shipments.
By rail	648,785	1,411,950
By water	3,417,800	2,174,000
Total	4,066,585	3,585,950

Last year at this time the canal was not open and not more than one or two cargoes had been received by lake. Not a sixth of the receipts and but two-fifths of the shipments were by rail this year.

For the same two weeks ending May 6, receipts at four Eastern ports were:

Bushels.	New York.	Boston.	Phila.	Baltimore.	Total.
1882	2,740,440	881,655	590,050	366,715	4,588,871
1881	3,444,639	1,059,757	629,240	1,181,654	6,315,250
P. c. of total:					
1882	60 6	19.2	12.2	8.0	100.0
1881	54.6	16.7	10.0	18.7	100.0

This year Baltimore alone has a smaller proportion than last. It and Philadelphia together have 20.2 per cent. of the whole, against 28.7 last year.

Chicago and Milwaukee Receipts.

For the first week of May receipts have been for four successive years:

	1879.	1880.	1881.	1882.
Chicago:				
Grain, bush	2,237,566	2,782,250	1,372,527	1,069,057
Flour, bbls	59,9 6	56,943	65,949	55,983
Hogs, No	94,358	141,592	109,983	121,170
Milwaukee:				
Grain, bush	506,654	316,178	253,325	183,175
Flour, bbls	38,748	41,039	45,128	65,926
Hogs, No	3,244	5,099	5,747	9,471

The receipts of grain are considerably larger this year than last, but much less than in the other two years.

Reducing flour to grain, the receipts of grain and flour at both places during the week were:

	1879.	1880.	1881.	1882.
Bushels	3,188,208	3,539,347	2,125,698	2,700,822

This year the receipts are 575,000 bushels (27 per cent.) *more* than last year, but 838,500 (23⅝ per cent.) *less* than in 1880, and 487,000 (15¼ per cent.) *less* than in 1879.

Iowa Trunk Line Association Rates.

Commissioner Daniels gives notice that hereafter on all business from Boston, New York, Philadelphia, Baltimore and points common thereto, destined to Council Bluffs and beyond (except California and Colorado business, and business to points on the Denver & Rio Grande Railroad), carried via all-rail routes to destinations, the following arbitraries will apply, regardless of what rates may prevail to Detroit, Toledo, Chicago, or Mississippi River points:

	1st.	2d.	3d.	4th.	5th.
Toledo or Detroit	81	64	47	33	28
Chicago or Milwaukee	76	59	43	30	25
East St. Louis	70	55	40	27	22

On business way-billed to Buffalo, Pittsburgh, or other termini of the trunk lines, and thence rebilled to points included in this Association, or on business coming from interior points, the local rates will govern as arbitraries West.

Western Railroad Weighing Association.

The Western Railroad Weighing Association, during the month of April, weighed 42,260 cars of freight, against 48,161 cars during the month of March, a decrease of 5,901 cars. The exhibit, considering the small movement in grain at present, is still a good one.

Southwestern Railway Association.

At the meeting of this Association in St. Louis, April 29, the proceedings referred to the Southwestern lumber pool. At a previous meeting held in Chicago it was decided to appoint a Board of Arbitration to consist of prominent lumber-dealers—one from Chicago and the other four from the Mississippi River districts—to agree upon the differences in rates to be made from their respective districts to Missouri River points. To this arrangement the Chicago lumber-dealers objected, claiming that being one to four they would not have a fair show. It was therefore found necessary to make a more satisfactory arrangement. For this reason it was agreed at Saturday's meeting to change the Board of Arbitration as follows: The four arbitrators from the Mississippi River districts to select a fifth, and those to agree upon the differences in rates to be made from their respective districts to Missouri River points. Then the Mississippi River arbitrator to select one man to meet the arbitrator from the Chicago district, and these two to select a third man. These three arbitrators then to agree upon the differences in rates from Chicago as against the differences in rates from Mississippi River districts.

An arrangement was also made to take into the pool the business from the old Missouri, Kansas & Texas line—namely: business from Hannibal and St. Louis via Sedalia and Holden to Junction City, southwest of Kansas City. This arrangement is to date back from March 1.

Tricks of the Trade.

A telegram from St. Louis, dated May 5, says: "It has been rumored for some days past that the east-bound rates from this city are not maintained, but nothing definite regarding the break could be learned, all the roads maintaining that they were strictly adhering to the tariff rates. Yet the fact that a meeting was held here yesterday for the purpose of investigating charges against certain roads was positive proof that the rumor was not groundless. * * It appears that a short time ago the Wabash preferred charges against the Indianapolis & St. Louis for violating the east-bound pooling arrangement. The charge was that the Indianapolis & St. Louis had been making out half-number way bills, the full number only being reported to the Commissioners, while the half-numbers were not reported at all. An investigation was ordered by Commissioner Fink, and the discovery was made that not only the Indianapolis & St. Louis had been playing the trick of making out half-number bills, but that the Wabash, which preferred the charges against the Indianapolis & St. Louis, had been guilty of the same offense, only on a larger scale. It was found that the Indianapolis & St. Louis had billed 600 tons of freight which had not been reported, while the Wabash had billed out 3,000 tons of which no report was made. The meeting yesterday was for the purpose of giving these roads an opportunity to make explanations for their queer behavior, and to take steps by which such irregularities can be prevented in the future."

This report is mainly correct, but there was no charge of breaking rates, but only (1) of concealing shipments. As each road is entitled to 20 per cent. of the whole, if one could conceal any shipments, it would receive the whole earnings from them besides its fifth of all the other shipments. The tricks were discovered at New York and St. Louis about the same time, but the meeting was not ordered from New York. As the trunk lines report all their way-bills to Mr. Fink's office, and the St Louis way-bills are checked by these, the "fractional" way-bills were sure to be discovered if they went over any trunk line. This is, perhaps, the most utterly scandalous of the many scandalous tricks that have been played in the traffic departments of the railroads. The St. Louis railroads are virtually partners, and the failure of one to report any of the pooled business is equivalent to one partner's pocketing a payment due to the firm.

Limiting Time for Free Storage of Checked Baggage.

The Chicago *Tribune* says: "All of the railroad companies terminating at Chicago have determined to place in public warehouses all baggage brought in by their trains that is allowed to remain in their depots more than twenty-four hours after its arrival. This determination has been brought about by the fact that it has become almost a custom for incoming passengers to allow their baggage to remain in the depots here for periods ranging from a week to two or three months; and the result has been that all of the baggage-rooms are so crowded that it is almost impossible for the railroad companies to handle baggage of outgoing passengers. The railroads have determined to charge 25 cents storage for the first day, and from 10 to 25 cents for each subsequent day after the first that the baggage is held in their warehouses. The railroad companies will hold the baggage free of storage twenty-four hours and no more after its arrival at Chicago. This new rule will take effect on most of the roads Wednesday, May 10, and on all of them by Thursday, June 1."

Doubtless unlimited storage of baggage costs something, but it is often a great convenience to the passengers, and it is desirable that only a reasonable charge should be made when the baggage is held. To charge a dollar for storing a trunk a week seems an altogether unreasonable charge.

Waybilling Baggage on Freight Trains.

The Chicago, Milwaukee & St. Paul and Chicago & Northwestern companies have determined not to check baggage any longer on their freight trains, but to have such baggage as is carried on freight trains regularly way-billed and charges collected for it the same as on any other freight, with this difference, however, that the railroad companies propose to carry the usual amount of baggage free. Baggage destined to be carried on freight trains will have to be delivered at the regular freight depots of the companies at least thirty minutes before the time of the departure of the freight train that is to carry it, so that the baggage can be regularly way-billed and loaded in freight cars. The new rule is owing to so many commercial travelers being desirous of traveling on freight trains and desiring their baggage to be carried with them. It has been found to be impracticable to check baggage and care for it on freight trains as is done on passenger trains, since these freight trains do not stop at the passenger station houses, and frequently depart from stations when the passenger station force is not on duty.

THE SCRAP HEAP.

Locomotive Building.

The Brooks Locomotive Works at Dunkirk, N. Y., are still running full time with an undiminished force. Five engines were recently shipped to the Chicago & Atlantic road, and several narrow-gauge engines are in the shops for the Denver & South Park Division of the Union Pacific.

The Chicago, St. Louis & New Orleans shops at McComb City, Miss., are building three new engines for the road.

The Cleveland, Columbus, Cincinnati & Indianapolis shops in Cleveland, O., are to build this year 12 new Mogul freight engines, with 18 by 24-in. cylinders, for the road.

The Carolina Central shops at Laurinburg, N. C., are building an engine with 16 by 24-in. cylinders and 5-ft. drivers. This is the first new engine ever built at these shops.

The Ohio & Mississippi shops in Vincennes, Ind., recently completed a new passenger engine for the road.

The Taylor Manufacturing Co. has been organized at Chambersburg, Pa., with $150,000 capital stock, to build locomotives and other machinery.

A project is on foot to build extensive iron and locomotive works at Curtis Creek, near Baltimore, the new deep-water terminus of the Baltimore & Ohio road.

The Rogers Locomotive Works in Paterson, N. J., are building several engines for the Pensacola & Atlantic road.

Car Notes.

The Central Vermont shops in St. Albans, Vt., are building four new passenger cars. They are 52 ft. long, have 42-in. wheels, and are supplied with all the latest conveniences. The inside finish is in mahogany.

The stockholders of the Cleveland Bridge & Car Works met last week and resolved to increase the capital stock to $500,000.

Billmyer & Small, at York, Pa., recently delivered several handsome narrow-gauge passenger cars to the St. Louis, Des Moines & Northern road.

Colwell & Canniug, of No. 115 Broadway, New York, have within the past week placed several large orders for passenger and freight cars, among the latter being 400 flat cars for the Canadian Pacific road.

The Savannah shops of the Central Railroad, of Georgia, last year built 3 new passenger and 25 box cars for the road.

The Norfolk & Western shops, at Petersburg, Va., are building a number of new box cars for the road.

The Philadelphia & Reading shops, in Reading, Pa, last year built 2 new passenger cars, 10 cabooses, 12 refrigerator, 180 box, 50 stock, 297 gondola and 796 coal cars for the road.

The Terre Haute & Indianapolis shops at Terre Haute, Ind., are building two new passenger cars, which are to be mounted on 42-in. wheels.

The Bradley Car Works in Worcester, Mass., are building 5 passenger cars for the Eastern road; 12 passenger and 100 coal cars for the Providence & Worcester, and 300 coal cars, to carry 20 tons each, for the New York & New England road.

The Indianapolis Car Works are building 200 box cars for the Cleveland, Columbus, Cincinnati & Indianapolis road.

Bridge Notes.

Raymond & Campbell, of Council Bluffs, Ia., have lately completed a combination bridge over the Des Moines River, on the St. Louis, Des Moines & Northern road.

The Clinton Bridge Company, at Clinton, Ia., has a number of contracts for new bridges to fill.

The Keyston Bridge Company, in Pittsburgh, has several important contracts to be filled this year.

Iron and Manufacturing Notes.

The new Powelton Furnace near Saxton, Bedford County, Pa., is nearly completed. It is 70 ft. high, and 18 ft. bosh,

and great pains have been taken to make it as near perfect as possible.

The largest furnace of the Cleveland Rolling Mill Co. at Cleveland, O., is to be put in blast soon.

A new blast furnace is to be built on the old Roaring Run Furnace property in Botetourt County, Va.

The Thomas Iron Co. is running its furnace at Gore, O., making 27 tons of pig iron a day.

The Vulcan Furnace Co., of Detroit, will soon begin to build a large blast furnace on the line of the Detroit, Mackinac & Marquette road.

The Railway Barb Fence Co., at Cuyahoga Falls, O., is fitting up an old mill as an addition to its works.

The Niles Tool Works, at Hamilton, O., have taken a contract to make the tools for the new repair shops of the Northern Pacific road.

Bailey & Shoemaker have their new rolling mill at Pine Iron Works, in Berks County, Pa., nearly ready to start up.

A dispatch from Cleveland, O., May 10, says: "The Cleveland Rolling Mill managers decline to say anything about the great strike, or rather lock-out, that occurred at their mills last night, except that they have been compelled to do what they have in self-defense. It is understood that the company did not object so much to the slight advance in price that the submitted scale contemplated as to the practical placing of their mills under the control of the Amalgamated Association of Iron Workers, as the men are said to have demanded. The company is rich, and not crowded with orders just now, and the burden of the strike will fall on the men. Of the 5,000 or 6,000 men in the Eighteenth Ward who are thrown out of work by this movement, only about one-half are directly interested in the question at issue between the Amalgamated Association and the Rolling Mill Company. The rest are laborers, teamsters, helpers, and those whose labor depends upon that of the skilled workingmen. The men have been very quiet to-day, walking about and holding discussions among themselves and having various secret conferences. No disturbances have occurred and none are expected, unless long persistence on one side and long resistance on the other should engender a bad feeling. An unusually good feeling has always existed between the managers and the men, and it is thought that steps may be taken at an early date to settle the difficulty. Another blast furnace will close to-morrow, which adds 200 men to those already idle."

The Rail Market.

Steel rails are steady at $50 to $53 per ton at mill, according to time of delivery. No large sales are reported, orders for the season having generally been placed.

Iron rails are more active and lower. Sales of heavy rails are reported at $45 per ton at mill, and there have been free sales of light sections at $47 to $49.

Spikes are steady at $2.85 to $3 per 100 lbs.; fish-plates, $2.50; track-bolts, $3.70 to $4.10.

There is some inquiry for steel blooms, and it is said that sales have been made at $41 per ton, duty paid.

Old iron rails have been quoted at $27 to $28 per ton in Philadelphia, with no sales reported. Crop ends have sold at $25 per ton.

The High Bridge Over the Des Moines.

The Iowa *State Register* thus describes the high bridge on which the St. Louis, Des Moines & Northern road crosses the Des Moines River:

"The structure is the design of Mr. Kinney, the Chief Engineer, assisted by Mr. C. F. Boweth, and its perfection does these men infinite credit. It was built by Messrs. Raymond & Campbell, the well-known bridge builders of Council Bluffs, who have done more than ordinary work on this mammoth structure. Mr. Raymond was one of the party to-day. The structure altogether is 2,020 ft. long, or two-fifths of a mile. The bridge proper consists of two spans, each 175 ft. from centre to centre. It is a combination bridge, part wood and part iron. It is 101 ft. above ordinary water in the river, the water below ranging from 6 to 14 ft. depth. It is supported on eight large iron cylinders, with the usual piers and trusses. The largest cylinders are 31 ft., the others 27 and 29 ft. The piers are 52 ft. high from the top of the cylinder to the lowest truss. The truss is 28 ft. high. In sinking the iron cylinders they passed through first a bed of sand, next a bed of bowlders, and are now resting on a bed of soapstone rock. The structure contains 742,000 ft. of pine lumber, 175,000 ft. of oak and took 19,000 lineal feet of piling. The highest bent of the trestle is 93 ft. high. It was begun about the middle of last August, and would have been completed before this but for delay in receiving iron and lumber. The piles were driven by steam, the coal for the engine being purchased in the neighborhood. There is coal all about in the neighborhood, the traces being evident all about the bluff.

"This is by far the longest and highest bridge in the state, and probably in any of our neighboring states, being higher than the Glasgow bridge across the Missouri for the Alton road.

"The structure has been a lucky structure, and its freedom from accidents has been remarkable. Two only are worthy of note. March 10, when the workmen were quitting for the evening, one more adventurous and more in a hurry concluded to take a short cut. He grasped a rope and started to slide down over the water. His gloves were wet and the rope icy, and ere long he was going down at a rapid rate. By some accident he had taken a rope which lacked 30 ft. of reaching the bottom, and before he knew it he was precipitated into the river, striking his leg some way and breaking it. Despite his broken leg, the man bravely swam ashore, otherwise unhurt. A short time since the men were raising a large bent, using a capstan and horse. The pins pulled out, and in a twinkling horse, capstan and all were flying about as a balance-weight to the falling bent. Luckily it was so well tackled that no damage was done."

A Considerate Train Robber.

Conductor Baldwin, of the New York & New England road, was formerly a conductor on the Iron Mountain Railroad of Missouri, and it was his train which the James boys attacked at Gadd's Hill in 1874, and from which they stole $11,000. The first person robbed was Conductor Baldwin. Among the property taken from him by Jesse James was his watch, an indispensable article for him to have in the performance of his duties as conductor. This fact Jesse James recognized, and before leaving the train he turned to the conductor with the grace of Claude Duval, and, handing him a watch, said: "Excuse me, sir, I did not think. You will need this to run your train." This timepiece is still carried by Mr. Baldwin.—*Bridgeport (Conn.) Standard.*

Palace Stock Cars.

The Chicago *Tribune* thus describes the stock cars recently built for the New York Live Stock Express Co.: "These cars are each 40 ft. long, 9 ft. wide and 8 ft. high. They are built throughout of the most solid material, the inside work being of oak and the sills and flooring of the best yellow Georgia pine. The running gear is equally commendable. The New York Central standard wrought-iron truck is used; elliptic springs as on passenger cars; passenger wheels, axles and bearings; the Hewitt box cover; Middleton's continuous draw-bar, and all are equipped with Tallman's patent automatic brake. The latter appliance has been tested thoroughly, and is pronounced by railroad men to be an admirable invention.

"The cars each furnish space for 16 head of cattle. Solid partitions separate the animals from each other, the intervening bars being movable, and when in place pressing against springs, which allow the stock to press against the bars without damage. The stock can be loaded from either end of the car and stand in groups of eight, half the load facing one way and half the other. Each animal has a clear space 2 ft. 2 in. in width in which to stand. Continuous shallow water-troughs run along the sides of the car, the water being supplied through a tank-box in the roof which can be fed from an ordinary railroad tank. Swinging-doors on the sides afford facilities for feeding without unloading."

Live-Saving Appliances on Trains.

In compliance with a law of Massachusetts, requiring all cars run on passenger trains in that state to be provided with tools to be used in case of accident, the Cheshire Railroad Company is conforming to the necessary requirements. The plan adopted is to attach a box under the floor, about the middle and near one side of the car, containing a steel bar, sledge, saw and rubber bucket. In one end of the box is inserted a round plate of glass, through which the tools are visible, and as it swings on hinges and locks by a spring inside when closed, the glass must be broken before it can be opened. On the outside is lettered the following: "Tools to be used in case of accident only. Agreeable to chapter 54, being an amendment of chapter 112, Statutes of Mass. To get at the spring-catch and tools the glass must be broken." Another like set of tools are supplied for the inside of cars, usually under a seat at the end of passenger, and where most convenient in baggage and mail cars.—*Keene (N. H.) Republican.*

An Engineer With a Musical Ear.

An engineer on the Pennsylvania Railroad, of a musical turn of mind, who runs a freight engine between here and Derry, has contrived an apparatus which he has affixed to the whistle of the locomotive, whereby he can let the steam escape therefrom in such a way as to run the musical scale, producing the steam notes with considerable accuracy. The engineer has not yet learned to play a tune, however.—*Pittsburgh Telegraph.*

Durability of Mortar.

The London *Builder* attributes the marvelous durability of mortar in Italy to the fact that the lime remains in a pit covered with water for two years before it is used, whereas in England lime is slaked and used the same day. Most building specifications even require newly slaked lime.

Why They Reduced the Fare.

It is stated that the reason the railroad bill reducing the fare to three cents passed the House was because the members were mistaken about which bill was up. They imagined the liquor bill was before them, and that the idea was to reduce drinks to three cents a smile, and of course they voted for it.—*Texas Siftings.*

A Large Steamboat.

The "Pilgrim," now being built at Chester, Pa., for the Old Colony line of steamships under a contract price of $1,000,000, will, it is said, be the largest side-wheel passenger steamship afloat. She is 386 ft. long; breadth of hull, 50 ft.; over guards, 87 ft.; depth of hold, 17 ft. Her engines will have a 110-in. cylinder, with a piston stroke of 14 ft. Each of the side wheels will be 42 ft. in diameter. She will run between New York, Newport and Fall River on the Old Colony Railroad's line between New York and Boston, as a consort of the well-known boats "Bristol" and "Providence."

What It Was.

The Chicago *Inter-Ocean*, which last week announced a mysterious discovery which was to put railroading ahead 50 years at a single bound, this week tapers off gracefully with the following:

"Mr. Perceval Lowell, the General Passenger Agent of the Chicago, Burlington & Quincy road, is recognized as a most enterprising railway man and a great admirer of feminine beauty, but his understanding of railway revolutions is greatly at fault and needs correction. It was Mr. Lowell's desire to introduce a new style of motive power on his road, the invention of Colonel P. Donan, which was to surprise the civilized world and make people wonder why they had been traveling according to the present system so long. But as this invention was a failure, and a novelty was absolutely necessary, Mr. Lowell has invented a new mode of railway advertising which is indeed novel."

New Sleeping Cars.

Two new sleeping cars to be run between this city and New York were turned out of the shops of the New York, New Haven & Hartford Railroad Company at New Haven yesterday and run down the road on a trial trip. In the completeness of their appointments and the elegance of their finish they are the finest cars ever built in New England, and are, without doubt, unsurpassed on any road in the country. They are named "New York" and "Boston," and each of them has been constructed with reference to strength and durability, as well as elegance. Both have two six-wheeled trucks, which are very heavy. They are painted an olive brown and are lettered "New York, Springfield & Boston Sleeping Car." The name of each car is painted in the centre in small ornamental block letters. They are fitted with 16 berths on a side or 32 in all, and are arranged so that they may be transformed into day coaches. The interior finish is of finely polished mahogany. The panels of the upper berths are of mahogany inlaid with walnut and white holly, with ornamental vine work, the whole forming a very handsome design. The head linings are of a special design. The material is card-board of a kind which neither shrinks nor swells; it is painted in unique designs, and is fastened with intersecting bands of beaded black walnut. The window sashes are double and the windows are of heavy plate glass with ground glass domes. The doors are very heavy and thick and of mahogany, with windows of cut plate glass. They are fitted with an adjustable contrivance which holds them open at any required angle. Patent ventilating apparatus of the best design furnish a constant supply of pure air. The lamps, curtain rods, berth fixtures and all the trimmings are silver plated. Each car is provided with a handsome Wilton carpet. The curtains are of a wine color and are trimmed with silk plush.—*Boston Traveler, May 5.*

Midland "Bogie" Carriages.

In a recent number of the *English Mechanic* the following description of the "bogie carriages" in use on the Midland Railway was given by a correspondent:

"The longest bogie carriages are 54 ft. in length between ends of frame. In 1876 the company possessed 68 bogie carriages—25 Pullman drawing-room cars, 11 Pullman sleeping cars, and 32 bogie carriages—all of which are carried upon two 4-wheeled bogies. The working of these was found so satisfactory that a number of 6-wheeled bogie carriages were ordered. These are the largest yet constructed. I give a few dimensions, since they may interest some of your readers:

Total length of frame	54 ft. 0 in.
Width over panels	8 " 0 "
Width outs de steps	8 " 6 "
Width of bogie frame	6 " 6 "
Distance from centre to centre of bogies	36 " 0 "
Wheel base of each bogie	10 " 6 "
Diam. of bogie-wheels	3 " 7 "

Three first-class compartments to hold 18 passengers, four third-class compartments to hold 40 passengers, and one luggage compartment. The centre of the roof is raised above the level of the outside and fitted with glass panes, affording additional light and ventilation. The latest carriages, however (1878-1881), are 4-wheeled bogies without the raised roof, all built at Derby. The Scottish Joint Stock (M. S. J. S.) possess 30 bogie carriages (ten 6-wheeled and twenty 4-wheeled bogies). The 6-wheeled bogies have not the raised roof."

Hopper Dredgers for the River Forth.

Messrs. W. Simons & Co., shipbuilders and engineers, Renfrew, have contracted to build one of their large patent hopper dredgers for the deepening operations in the River Forth, being the second hopper dredger they have supplied for this work. It will be nearly similar to the "Willunga," which this firm sent to Australia, and which the treasurer reported to the House of Assembly, Adelaide, had dredged and removed the limestone crust sea-bar there, at the cost of 7½d. per cubic yard, a work which previously cost them at the rate of 4s. 1d. per cubic yard by their stationary dredgers and barges.—*Engineering.*

OLD AND NEW ROADS.

Atlantic & North Carolina.—The directors of this company (whose road is leased to the Midland North Carolina) met in Raleigh, N. C., May 10, and adopted a resolution to the effect that the lessees had not, in accordance with the terms of the lease, extended the road from Goldsboro to Salisbury in a rapid manner, and that they had violated another provision of the lease in recording a mortgage on the road. But in order that the lessees may have time to explain these matters, the meeting did not take immediate action, deferring it until the next meeting, two weeks hence.

Bangor & Portland.—At the annual meeting in Bangor, Pa., last week, the stockholders of this company and the Chapman & Lehigh Company met and ratified an agreement made between the directors of the two companies, merging the rights, powers and privileges of the Chapman & Lehigh Company into the Bangor & Portland Railway Company.

The report presented showed a very encouraging increase of business during the past year. Fifteen miles of the road are now in operation from Portland to Pen Argyl. The grading of the Nazareth Extension will be finished during the present month. It is expected that rails will be laid to Nazareth by Aug. 1, making 25 miles of road, with steel rails, in operation. Satisfactory arrangements have been made with the Crane Iron Company, of Catasauqua, for the crossing of the Lehigh River at that place and connections with the railroads in the Lehigh Valley, should the company see fit to make that their terminus. When completed, the distance from Portland to the Lehigh River will be 37 miles, and the road passes near all the important slate quarries of that section. A preliminary survey is now being made for a branch of this road from Nazareth to Easton, a distance of about eight miles.

Beardstown, Ft. Madison & Dakota.—This company has been organized to build a railroad from Beardstown, Ill., to Ft. Madison, Ia., about 70 miles.

Boston, Lowell & Concord.—A dispatch from Concord, N. H., May 9, says: "An injunction has been filed with the Clerk of the Supreme Court of the state of New Hampshire forbidding the officers of the Concord Railroad to manage its affairs in copartnership with the Boston & Lowell Railroad, or any corporation or person, but they are commanded to transact its business themselves in accordance with its charter and the law of the state."

Camden & Atlantic.—The Philadelphia *North American* of May 9 says: "The Narrow-gauge (Philadelphia & Atlantic City) Railroad, which has been run with varying fortunes since its construction in 1877, yesterday passed into the hands of the Camden & Atlantic, its purchase having been indorsed by the directors of the latter line at a meeting yesterday afternoon.

"The price paid is kept secret, and the approval of the stockholders has yet to be obtained to the transaction. The Narrow-gauge will be used exclusively for freight traffic, leaving the main line entirely free for the transportation of passengers. The branch to Ocean City was recently secured by the West Jersey.

"The Narrow-gauge did a large excursion business last summer, which will now in all probability be transferred to the Camden & Atlantic."

Carlisle & South Mountain.—A survey has been made for a new railroad from Carlisle, Pa., to the South Mountain. It will be about 21 miles long, and will reach a number of iron mines.

Central Iowa.—This company has bought the Grinnell & Montezuma road, which it has worked for some time. It is 14 miles long, from Grinnell Junction, Ia., southwest to Montezuma. The Central pays for the road $12,000 per mile in 6 per cent. bonds and $15,000 per mile in stock.

Central, of New Jersey.—Application having been made to the Chancellor of New Jersey in relation to the election which it was proposed to hold on the call of certain stockholders, he last week made an order rescinding and canceling the order permitting an election, on the ground that if it were held as proposed, without sanction of the directors, there would be grave doubts as to its legality, and a board of directors so chosen would only bring an additional complication into the case. At the same time the Chancellor granted leave to file a new petition asking for a peremptory order directing the board to call a meeting.

A new petition was therefore filed by the Gowen-Garrett party. Upon representation of counsel for the directors that they desired to be heard, argument on the petition was postponed until May 13, when it will be heard by the Chancellor.

Chicago, St. Paul, Minneapolis & Omaha.—This company gives notice that it will issue $1,006,600 preferred stock and $1,509,900 common stock on 100.35 miles of road recently completed. The new lines, all built this year, are the extension of the Norfolk Branch to Norfolk, Neb., 46.87 miles; an extension of the North Wisconsin Division from Cable, Wis., north 20 miles, making this line 139 miles long; a section of 20 miles of the new Superior Branch from Chippewa Falls, Wis., northward 20 miles. The remaining line

is the Chippewa Falls & Northern road, 14.26 miles, lately acquired.

Cincinnati, Hamilton & Dayton.—The latest report concerning this company is that the Erie and the New York, Chicago & St. Louis have come to an understanding and that the two companies together now have stock enough to control the road, even if no more should be transferred to the Erie. It is also said that an agreement has been concluded for a division of the traffic of the road, so far as possible. The road is of more importance to the Erie than to the other company, but it might be made of considerable use to the Chicago line.

Conesus Lake.—This company has been organized to build a short branch from Trew's Siding, N. Y., on the New York, Lake Erie & Western road, to Lakeville on Conesus Lake. The road will be two miles long.

Coudersport & Port Allegheny.—This company has secured a lease of the right of way from Port Allegheny, Pa., to Coudersport, obtained some years ago by the Jersey Shore, Pine Creek & Buffalo Company. The sum paid was $7,000, the Jersey Shore Company reserving the right to repossess itself of the road at the expiration of the lease by paying for all improvements. The contract for building the road has been let to Homer C. Blakeslee, of Olean, N. Y., for $45,000, which includes grading, ballasting and laying of ties.

Delaware & Hudson Canal.—This company has let to Rogers & O'Brien the contract for grading an extension of the Cherry Valley Branch of its Albany & Susquehanna line from Cherry Valley, N. Y., to Richfield Springs, about 14 miles. It is reported that this company has leased from the Delaware, Lackawanna & Western the right to run trains over that company's track from Richfield Springs to Utica, when the new road is completed.

Denver & New Orleans.—Track on this road is now laid to Pueblo, Col., 120 miles south of Denver, and regular trains begin to run this week. The line is generally parallel to but east of the Denver & Rio Grande. A short branch is to be built to reach Colorado Springs.

Duluth & Iron Range.—This company has been revived and reorganized, and is now having a preliminary survey made of its projected road from Duluth, Minn., to the Iron region around Vermillion.

Genesee Valley.—A contract for ballasting the track as fast as laid on 50 miles of this road, at the southern end, has been let to James O'Connor, of Oswego, N. Y. He is to begin work at once.

Grand Rapids & Indiana.—Work is well advanced on the extension to the Straits of Mackinaw, and it is expected that the road will be open for travel by the middle of June.

Kansas City, Ft. Scott & Gulf.—It is reported that negotiations are in progress for the sale or lease of this road to the Chicago & Alton Company. It would be a feeder of some importance to the Chicago & Alton, which probably gets some share of its traffic now.

Kansas City, Springfield & Memphis.—On this extension of the Kansas City, Ft. Scott & Gulf road track is now laid for 10 miles southeast from Springfield, Mo. The grading is nearly completed for 50 miles, except at one point where there is a heavy rock cutting. The entire length of the road, from Springfield to the Mississippi opposite Memphis, is about 275 miles.

Lake Shore & Michigan Southern.—At the annual meeting last week the stockholders voted to ratify and confirm a contract by which this company and the Pittsburgh & Lake Erie guarantee interest on the bonds and 6 per cent. on the stock of the Pittsburgh, McKeesport & Youghiogheny Company, whose road is now under construction from Pittsburgh into the Connellsville coke region.

Lehigh Valley.—The suit brought by the state of Pennsylvania to recover certain back taxes on this company's bonds, amounting to about $126,000 in all, has been decided in favor of the company by the Pennsylvania Supreme Court. It was a test case, some 30 other similar suits depending on the decision in this.

The directors have approved the new contract with the New York, Lake Erie & Western Company for the exchange of traffic, and for carrying coal from this road westward over the Erie lines from Waverly. Reference has already been made to this contract, which is substantially a renewal of the old agreement, with some additional facilities for coal traffic.

Louisville, Evansville & St. Louis.—On the unfinished section of this road between New Albany, Ind., and Oakland, 92 miles, track was laid last year from New Albany to Milltown, 15 miles. This year the rails have been laid from Oakland east 14 miles and from Huntingburg, the junction with the Evansville Division, east to Birdseye, 16 miles, leaving two gaps, about 47 miles in all, to complete the road.

On the 90 miles between Oakland, Ind., and Mt. Vernon, Ill., regular trains are running, but only a moderate business is expected until the road is completed through.

Louisville & Lake Michigan Southern.—This company is a reorganizatiou of one known as the Louisville, Harrodsburg & Virginia. Arrangements have been made to have the projected road surveyed, and located at once. The road is to run from Louisville, east by south into Eastern Kentucky; the terminus is not yet decided on.

Massachusetts Central.—The Boston *Herald* of May 8 says: "The affairs of this company seem to be approaching another crisis; that is to say, the funds have about given out, and another round $1,000,000, or thereabouts, is considered necessary to complete the road from Boston to Northampton. The work of construction continues, in a limited way, and will go on a little while longer under the existing arrangements, but it is thought best to call the stockholders and bondholders together this week Thursday, to survey the situation and deliberate upon a course to be pursued. In the spring of 1880 it will be remembered that the finances of the road were reorganized, the old 7 per cent. bonds being bought up, and an issue of $3,500,000 first mortgage 6 per cent. gold bonds being issued. A syndicate took $1,500,000 at 80, on which $1,200,000 was realized. The distribution of these bonds, and the virtual control of the remaining $2,000,000, was given into the hands of a committee, consisting of the President of the railroad and two representatives of the syndicate, the proceeds to be used for the cancellation of the old bonds and to meet construction expenses. With the $1,500,000 bonds went $750,000 of stock as a bonus. Subsequently another $1,000,000 of bonds was sold at prices ranging from 95 to something better than par, and it is said that the balance could have been readily disposed of for par at that time. It was not, however, deemed wise to sell the whole then, and the unwisdom of the decision is now apparent. The common stock was then selling for 40. To-day the bonds are about 60, and the stock 9¼. Of the remaining $1,000,000 of bonds, $400,000 is held by Charles A. Sweet & Co., as collateral for money advanced to pay construction expenses. The balance may have been similarly used. Just how much the company has realized from the sale of the $3,500,000 of bonds is not now made public, but may be at Thursday's meeting. So far as the company is concerned, the bonds are out of its hands and the proceeds have presumably gone into construction and for the payment of the interest on the bonds; $3,500,000 of common stock is also all issued, about $1,000,000 being held by towns along the line of the road, and the balance by over 500 individuals. Mr. Norman C. Munson, the contractor for building the road, is a very large owner. By some he is thought to hold a controlling interest. He also owns the equipment of the road, and is operating the completed portion from Boston to Jefferson's. The extent of Mr. Munson's interest in the bonds is not known. For what has been expended the company has to show its franchise, 44 miles of completed road, 12 miles of road from Jefferson to Coldbrook ready for the rails, a roadbed nearly graded from Coldbrook to Ware and about three-fourths completed from Ware to Northampton. The right of way on the whole line is nearly all secured. Ties are on hand for 10 or 15 miles of track, and enough steel rails have been paid for for the balance of the line. Of the rails, however, 2,500 tons are in bond at East Boston, on which a duty of $28 per ton must be paid. The 41 miles of completed road are now earning the operating expenses, although they did not during the winter, and new business is being constantly acquired. Upon the opening of the line to Ware, it is believed that the earnings will largely increase. The road was to have been finished for the amount of the bonds, but it cannot be, and, as before stated, the sum estimated to be necessary for its completion is $1,000,000. In explanation of the present condition of affairs, it is said that it cost a good deal more to buy the old 7 per cent. bonds than was supposed to be necessary. Some $700,000 is said to have been the expenditure for this purpose. The right of way, especially in Watertown and Belmont, cost considerably more than was anticipated. Much of the grading done prior to 1873 had to be done over again, and the cost of the work in general exceeded the estimates. Moreover, the purchase of the whole amount of steel rails, so far in advance of their probable use, is the occasion of no small loss. But whatever the explanation, the fact is that the money is gone, and additional means must be provided, or the work of construction will soon stop. Were the securities of the road bringing anything like par, work would probably continue for some time. They are not, however, and the security holders will be invited to listen to a plain statement of the case, and express their wish in the premises. It is thought probable that a committee will be appointed to make a thorough examination of affairs, and recommend a course of action. The road has a chartered right to issue $6,000,000 in stock, but whether it will exercise this right or adopt one or more other courses which are before it, cannot even be conjectured. The security holders and general public will doubtless know more about the affairs of the company than it now does after Thursday's meeting."

Midland North Carolina.—The Midland Improvement & Construction Company, which is building this road, reports receipts up to Jan. 1 last, from subscriptions and interest, of $355,767.67. Expenditures for construction, equipment and securities have been $105,294.05, leaving a balance of $250,473.62 on hand. The company owns 37,500 of the 50,000 shares of the par value of $100 each in the capital stock of the Midland North Carolina Railway Company, the same being held in trust by the treasurer of the Midland Improvement & Construction Company, pursuant to vote of its directors, June 8, 1881. On July 1 last the Midland North Carolina Railway Company secured a lease of the Atlantic & North Carolina Railroad for the term of 30 years, at an annual rental of $40,000, and since that date the road has earned for the six months ending Dec. 31, 1881, $72,862.10, being an increase of 48 per cent. or $23,720 over same months of the previous year. The operating expenses, including rent, amounted to $63,365.92; net earnings, $9,496.18. To put the property in thorough and complete working order it has been deemed necessary to make permanent improvement and extraordinary repairs to an unusual extent, and the sum of $11,232.92 has been expended for that purpose.

Minneapolis & St. Louis.—It is now stated that the Chicago, Rock Island & Pacific Company is not interested in the recent purchase of the controlling interest in this road, the stock having been bought by the Chicago, St. Paul, Minneapolis & Omaha. The new President of the company, Mr. R. R. Cable, while he is a director and large owner in the Chicago, St. Paul, Minneapolis & Omaha, is also Vice-President and General Manager of the Rock Island road, and it is not probable that any interests of that road will suffer. The new owners of the road, it is said, will provide the money needed to complete the extensions of the road now in progress. They intend to work the road with a view of making all the profit possible for its owners, and for its future development.

Natchez, Jackson & Columbus.—This road is now completed and trains are running regularly to Utica in Hinds County, Miss., seven miles beyond the late terminus at Upper Bayou Pierre, and 67 miles northeast from Natchez. There remain 31 miles to reach Jackson, of which 15 miles from Utica and 10 miles from Jackson have been graded, leaving a gap of six miles, on which work is now in progress. The road is 3 ft. 6 in. gauge and is laid with 35-lb. rails. The road-bed is made 10 ft. wide on embankments and 14 ft. in cuts. The maximum grade is 79.2 ft. to the mile. The contractors are Duffin & Brothers.

New Bonds.—New issues of bonds are offered on the market as follows:

New York & Atlantic bonds are offered by the American Finance Company, of New York. The bonds are first-mortgage, 6 per cent., 30-year, the total issue being $500,000. Each purchaser of $5,000 at par will receive also $5,000 income bonds and $10,000 stock. The road will be seven miles long, making (with steam ferries) a new line from New York to Coney Island and Rockaway.

New York & Atlantic.—This company is making arrangements to dispose of $1,000,000 bonds and an equal amount of stock. The road is to run from Thirty-sixth street, on Gowanus Bay, Brooklyn, to Canarsie Bay, 6¾ miles, and arrangements have been made for a Coney Island line by using some two miles of the Prospect Park & Coney Island road. The company will run a fast steam ferry from the Thirty-sixth street terminus to New York. The right of way has all been secured, part of the grading done and the tracklaying from Thirty-sixth street to Greenwood Cemetery in progress.

New York, Chicago & St. Louis.—It is reported that this company has concluded a contract with the Calumet Land Company for the erection of repair shops at South Chicago, to cost about $500,000. These will be the principal shops of the road.

New York City & Northern.—This company defaulted on the interest on the $3,685,000 of its general mortgage bonds, due May 1. No explanation has been issued by the company.

The road is said to be doing as well as could be expected, but it is hardly possible that it has been earning enough to pay the interest on its very large debt.

New York & New England.—The following circular has recently been issued by General Manager Felton:

"Hereafter no person will be allowed to ride on the engines of this company, either in the yard or on the road, excepting the engineer and fireman regularly assigned to the engine, Superintendent of Motive Power, Superintendents, Master Mechanic, Engineer of Maintenance of Way, Train-Master, Road-Master, or supervisors on their divisions, Supervisor of engines, conductors of trains, and brakemen while flagging, or hostler while on duty, without a written order from the General Manager, Superintendent or Superintendent of Motive Power.

"The engineer or, in his absence, the fireman or hostler, will be held strictly accountable for the enforcement of the above rule, and will not under any circumstances permit any deviation from it. It is made a duty of all officers of the Transportation, as well as of the Motive Power Department, to see that this order is enforced."

New York, Susquehanna & Western.—At the annual meeting last week the stockholders voted to reduce the authorized issue from $10,000,000 preferred and $20,000,000 common stock to $8,000,000 preferred and $13,000,000 common stock. The stock will still be over $150,000 per mile of road completed and projected.

Norfolk & Western.—The New River Company has been consolidated with this company, and will hereafter be known as the New River Division of this company's lines. The road is now under construction from New River, Va., to the Flat Top coal region in West Virginia, about 70 miles. All the stock of the New River Company was owned by the Norfolk & Western, so that the change is merely formal.

North Carolina Midland.—The work on this road has been progressing quietly for some time, and it is now completed from Danville, Va., west by south to Leaksville in Rockingham County, N. C., a distance of 25 miles. At a recent meeting it was resolved to continue work on the line from Leaksville southwest through Winston to Statesville. The road is now controlled by the Richmond & Danville, and will form a second or loop line for that road from Danville to Charlotte, generally from 20 to 40 miles west of the old road. It was originally begun as an independent Southern connection for the Virginia Midland.

Northern Pacific.—The headings from the east and west ends of the Big Horn tunnel in Montana have met, and the tunnel will be ready for the track this month. It is 1,150 ft. long and is the heaviest piece of work east of the Rocky Mountains. It is expected that the grading will be completed to Benson's Landing, 340 miles west of Glendive, and 1,030 miles from St. Paul, in June.

Philadelphia & Atlantic City.—This road from Camden to Atlantic City, which has been in possession of a receiver for three years past, has been sold to one of its rivals, the Camden & Atlantic Company.

Philadelphia & Reading.—At the stockholders' meeting in London, England, April 21, full accounts of which have just been received, Mr. Gowen himself presided, and from his speech we have more definite utterances as to the proposed financial arrangements than had previously been given out. He said:

"The general mortgage debt now outstanding is $19,686,000. Under the terms of that mortgage and under the terms of the two prospectuses under which it was sold in this market, the company reserves the right at any period of annual drawing and increase the sinking fund to any amount and out of any funds, and the drawing must take place in the month of May. It is, of course, practically unnecessary to go through the form of drawing for the sinking fund when every bond is to be paid; but whether we go through the formality of drawing or not, the company need not determine whether it will pay the general mortgage until the end of May, and the payment need not be made before the first day of July. As the company is now relieved from financial danger, whether we pay this general mortgage this year or next will depend entirely upon the price at which we can sell the new 5 per cent. securities. I do not think it would be wise for us to sell these new securities this month lower than we may reasonably hope to get next month or next year, for the mere purpose of saving 1 per cent for one year upon the amount of the debt. * * * * * I am hopeful of paying them, and we have given the preliminary notice to the trustee so that we may be able to pay them if it should seem desirable to do so. But apart from the general mortgage bonds there are other 6 and 7 per cent. obligations which must be paid, some of which mature on July 1 next, and others are of a class which, although not yet due, we have a right to pay, and which must necessarily be paid under the terms of their issue before any dividend can be paid to the shareholders. These securities are the following: Income mortgage bonds, which are 7 per cent. obligations, and are outstanding to the extent of $2,454,000. We can pay them at any time, and we propose to include them in the amount to be provided for between this and July 1. Again, there is the scrip outstanding in this country and in America that was issued in respect of the funded coupons of the general mortgage bonds and of later securities. The amount of this scrip in both countries is $5,181,155. It bears 6 per cent. interest, matures on July 1 next, and consequently, must be provided for. There are also outstanding receiver's certificates, that were issued on account of indebtedness that existed on the day the Receivers took the property, and which must be paid before the receivership can be ended. They amount to $2,386,457. There are arrears of interest on the general mortgage bonds, and upon other securities of the company, including the scrip, which amount to about $1,500,000. These arrears of interest must be provided for. * * * * * The company will also require about $1,000,000 for the purpose of constructing the line of rail which has to be completed under the contract of the New York Central, to which I will refer hereafter; all these amounts aggregate about $12,600,000, and, including the general mortgage bonds, they amount to $32,207,000. It is proposed to make an issue of at least the former amount, say $12,600,000 of the new securities for the purpose of providing for the payment of the various obligations thus referred to, the result of which will be the reduction of the fixed charges to the extent of the difference between 5 per cent. and the higher rates which are now paid upon most of them. As to the further reduction of fixed charges, there are about $25,000,000 of the consolidated mortgage 6 per cent. bonds selling at nearly 120. Of course, we cannot expect to effect any reduction upon that until the period at which the length of time which the bonds have to run is so short as to induce persons to convert it into a long 5 per cent. obligation. Of the $55,000,000 of leased lines securities, there are probably $25,000,000 which are selling at so high a price that it will be difficult for a long time to get any of them in. The improvement mortgage bonds of the company have not many years to run. The price is not likely to increase very much henceforth, by reason of the large annual drawings for the sinking fund. We can draw in October $1,666,000 of these obligations at par. Some

$12,000,000 of the obligations of the Coal & Iron Company mature within 10 or 11 years. In the course of a few years a large amount of these can be taken in. They bear interest at 7 per cent., and in a very few years probably the whole of them can be converted into the new 5 per cent. obligations. I look forward, therefore, with confidence to being able within a few years to convert a hundred millions of the present obligations of the company upon which from 6 to 7 or more is being paid, into an obligation bearing interest at 5 per cent.; and I expect the saving by this operation alone, irrespective of any further earnings, will open the way to a dividend on the share capital."

Pleasantville & Ocean City.—It is announced that this road has been sold to the West Jersey Company. It is 7½ miles long, from Pleasantville, N. J., to Somers Point, and was built about a year ago. It has heretofore been worked by the Philadelphia & Atlantic City road. The road will be changed at once from 3 ft. 6 in. to standard gauge.

Port Huron & Northwestern.—Work is to be begun very soon on the extension of this road from Sand Beach, Mich., to Port Austin, about 20 miles.

Richmond & Allegheny.—In the Circuit Court at Richmond, Va., May 2, a suit was begun by Bolling W. Haxall and others nominally against the old James River & Kanawha Canal Company, but really against this company, which, with its stockholders and others, is made a party to the suit. The plaintiffs in the suit hold some 4,460 shares of the stock of the James River & Kanawha Canal Company, and the complaint alleges that their rights were voted away without their consent by the state of Virginia and the cities of Richmond and Lynchburg, owners of a majority of the stock, and that the Richmond & Allegheny Company has refused to recognize their rights. They also charge that the affairs of that company have been extravagantly conducted, and that it has an excessive debt which it is unable to pay, and is likely at any time to be deprived of the means of operating the road. They therefore ask that the deed, by which the canal was conveyed to the Richmond & Allegheny Company, be set aside and a receiver appointed to take charge until the James River & Kanawha Canal Company can be reorganized and take possession.

Richmond & Three Forks.—It is stated that the Kentucky Central Company has agreed to take $500,000 stock in this road, which will be a controlling interest. The line is to run from Richmond, Ky., west about 40 miles to the Three Forks of Kentucky, through a country rich in coal but rough and hilly.

Rochester & Pittsburgh.—It is said that an agreement has been concluded between this company and the New York, Lake Erie & Western, under which all opposition to the construction of the company's extension is to be withdrawn, and several pending disputes over crossings are settled. The Erie is to be allowed to use part of the disputed right of way at Ridgeway, Pa. The agreement also provides for the exchange of traffic between the two roads.

Sabine & East Texas.—This road has been completed and opened for business to Woodville, the county seat of Tyler County, Tex., 20 miles northward from the old terminus at Village, and 55 miles from Beaumont.

St. Louis, Salem & Little Rock.—Surveys are being made for an extension of the Sligo Branch from Sligo Furnace, Mo., to the Howe iron bank and Nova Scotia Furnace, about 22 miles. Surveys have also been made for a branch from the main line near Salem, Mo., to the Plank iron bank, about five miles.

St. Paul, Minneapolis & Manitoba.—The land sales for April, to 159 purchasers, were 17,328.73 acres for $105,047.54, an average of $6 per acre, and some 109 acres to each purchaser. For the first four months of the year the sales aggregated 63,741.59 acres for $370,008.86, an average per acre of $3.88. The purchasers numbered 804, shows average holders of about 80 acres each, all of them being to actual settlers.

Shenandoah Valley.—At the annual meeting in Luray, Va., May 3, the President reported that the road would be finished to Roanoke by June 15. The capital stock issued is $3,696,200; funded debt, $6,200,000.

The stockholders resolved to have the fiscal year end Sept. 30, like most of the Virginia roads; to authorize the directors to accept or reject amendments to the charter; to authorize the board to complete the consolidation or lease of the road as proposed (to the Norfolk & Western), and to authorize the construction of branch lines to iron mines and other points.

Sonora.—We learn from an engineer who recently passed over this road that there are now about 190 miles of track laid from Guaymas north toward the United States border, leaving 166 miles to be finished to reach the junction with the Southern Pacific at Benson. For 218 miles from Guaymas northward the ruling grade is 26.4 ft. per mile (compensated on curves). Then for 45 miles it is 45 ft. An ascent of 96 ft. per mile followed by a descent at the same rate and for the same distance crosses the summit range just south of the boundary. For 254 miles from this summit southward to Guaymas the ruling grade is 20 ft. per mile. When completed, steamers will run between Guaymas and Mexican coast points, and the company expects to command the traffic of that coast, now carried chiefly by the Pacific Mail steamers.

South Carolina.—A circular from this company gives the following statement of earnings for the three months ending March 31:

	1882.	1881.	Inc. or Dec.	P. c.
Passengers	$75,095	$62,195	I. $12,900	20.8
Freight	280,555	300,449	D. 19,894	6.6
Mail, etc.	9,469	9,597	D. 128	1.3
Total	$365,119	$372,241	D. $7,122	1.9

"For the same period the receipts of cotton at Charleston were: 1882, 48,039 bales; 1881, 82,249 bales; decrease, 34,210 bales, due to deficiency of crop. This has caused a loss to us of $35,000 in revenue, which, however, was nearly made up by increased receipts from other business. As the active cotton season has ended, we should have little additional loss to overcome during the remainder of the season."

Tennessee & Sequatchie Valley.—A large interest in this road has been sold to Mr. Charles Clinton, of New Orleans, who will, it is stated, advance a considerable sum to complete the road from Spring City, Tenn., to the proposed terminus in the Sequatchie Valley.

Utah Central.—This company makes the following statement for March and the nine months from July 1, 1881, to March 31, 1882:

	March.	Nine months.
Earnings	$121,026	1,147,574
Expenses	50,733	459,329
Net earnings	$70,293	$688,245

For the three months of this year the earnings were $360,497; expenses, $151,134; net earnings, $209,363.

Wheeling, Parkersburg & Charleston.—The final location of this road has been made from Wheeling, W. Va., down the east side of the Ohio to Parkersburg, about 80 miles. The right of way has been secured, for 43 miles, and a committee is now engaged on the remaining 37 miles. A proposition has been received for the construction of the road, provided the right of way can be secured and paid for by the company.

Wilmington & Weldon.—This company has recently had a survey made for a branch from Goldsboro, N. C., southwest to Fayetteville, about 55 miles. Another survey is now in progress for a branch from Goldsboro east by north to Greenville, about 40 miles.

ANNUAL REPORTS.

The following is an index to the annual reports of railroad companies which have been reviewed in previous numbers of the present volume of the *Railroad Gazette:*

Michigan Central.

During the year 1881 this company worked 949.59 miles of road, the mileage having been increased by the Detroit & Bay City, 150 miles, acquired by purchase after foreclosure. The lines worked were as follows:

Main line, Detroit to Kensington	270.07
" " Kensington to Chicago, used jointly with Illinois Central	14.00
Total main line	284.07
Air Line Division	103.60
Joliet Division	45 00
Grand River Valley Division	84.00
Jackson, Lansing & Saginaw Division	231.80
Kalamazoo & South Haven Division	40.00
Niles & South Bend Division	11.12
Detroit & Bay City Division	150.00
Total	949.59

There are on the main line 89 miles of second track; on all the lines, 286.43 miles of sidings. There are 744.06 miles of track laid with steel.

Since the close of the year the extension of the Jackson, Lansing & Saginaw Division from Gaylord to Mackinaw, 63 miles, has been completed, making the present mileage 1,012.59 miles.

The equipment consists of 254 locomotives; 84 first-class passenger, 26 second-class passenger, 3 dining, 14 combination, 6 postal and 33 baggage and mail cars; 4,523 box, 486 stock, 1,431 platform and coal and 155 caboose cars; 1 pay car, 2 inspection cars, 5 derrick cars and 1 pile-driver.

From the Jackson, Lansing & Saginaw land grant 45,667 acres were sold last year, leaving 363,214 acres unsold. The total amount of land and timber sales was $758,643.91. The cash receipts on land accounts were $581,162.32. The expenses of the Land Department, including taxes, were $47,187.35; amount paid to trustees for purchase of bonds, etc., $501,521.99, leaving a balance of $32,458.98. The total land assets, including all contracts and lands unsold, amount to $3,993,971.62, estimated value.

The general balance sheet is as follows:

Capital stock		$18,738,204.00
Bond accounts:		
Mortgage loan ($119,000 in sinking fund)	$556,000	
First sinking fund ($470,500 in sinking fund)	1,508,000	
Second sinking fund ($158,000 in sinking fund)	671,000	
Equipment	556,000	
Air Line	1,900,000	
Consolidated	8,000,000	
Grand River Valley	500,000	
Detroit & Bay City	3,576,000	
		17,267,000.00
Proceeds of J., L. & S. extension bonds		181,943.10
Accounts payable		771,203.52
Income account to Dec. 31, 1878		2,784,598.19
" " from Jan. 1, 1879		346,819.17
Total		$40,089,827.98
Construction accounts:		
Main line	$28,035,569.95	
Proprietary line, Detroit & Bay City	3,541,038.89	
Leased lines	5,153,729.92	
Trustee equipment	545,245.82	
Total	$38,175,584.58	
Investments	482,699.99	
Fuel and supplies	282,457.37	
Accounts receivable	659,566.07	
Cash	489,519.97	
		40,089,827.98

The trustees of the first sinking fund report that they hold in securities of all kinds and cash $1,515,235.42. In the second sinking fund there is, in securities and cash, the sum of $487,408.15.

Deducting bonds held by the sinking funds, the bonded debt is $16,519,500, the yearly interest on which is $1,124,280. The company is also liable for $424,000 Detroit & Bay City bonds, interest $33,920, and for $6,045,000 leased line bonds, on which the interest is $486,160. There are rental charges, apart from interest, amounting to $159,750, making the amount of the fixed charges for interest and rentals $1,804,110 yearly.

The traffic for the year was as follows:

Train miles:	1881.	1880.	Inc. or Dec.	P. c.
Passenger	2,213,971	1,805,258	I. 348,713	18.7
Freight	4,285,560	3,658,605	I. 626,964	17.2
Service	266,153	241,023	I. 25,130	10.4
Switching	2,227,073	1,925,181	I. 301,892	15.7
Total	8,992,766	7,690,067	I. 1,302,699	16.9
Passengers carried	2,079,289	1,699,810	I. 379,479	22.3
Passenger miles	135,706,148	115,523,789	I. 20,182,359	17.5
Tons freight carried	4,196,896	3,797,137	I. 390,759	10.5
Ton miles	790,022,930	735,611,995	I. 54,410,935	7.4
Av. train load:				
Passengers, No.	61.29	61.93	D. 0.64	1.0
Freight, tons	184.34	201.04	D. 16.70	8.3

The cost of locomotive service was 19.76 cents per mile run, an increase of 2.03 cents, or 11.5 per cent., over 1880. The average train hauled was 5.12 passenger, or 21.77 freight cars, against 5.54 passenger or 24.16 freight cars in 1880.

The division of traffic and the average rates received were as follows, the rates in cents:

	1881. Miles.	Rate.	1880. Miles.	Rate.
Passenger:				
Through, eastward	24,059,912	1.895	21,994,048	2.041
Through, westward	25,684,392	1.642	18,713,328	2.103
Emigrant	19,879,432	0.978	22,450,768	1.047
Total through	69,623,736	1.540	63,159,044	1.706
Local	66,082,412	2.634	52,364,745	2.644
Total	135,706,148	2.073	115,523,789	2.131
Freight:				
Through eastward	368,260,300	0.473	357,273,540	0.719
Through westward	196,440,130	0.438	167,179,440	0.494
Total through	564,700,430	0.461	524,452,980	0.648
Local	225,322,500	1.364	211,159,015	1.326
Total	790,022,930	0.718	735,611,995	0.842

The average rate per passenger per mile shows a decrease from 2.131 to 2.073 cents, being 0.058 cent, or 2.8 per cent. The rate per ton per mile was 0.718 cent, against 0.842 cent, a decrease of 0.124 cent, or 14.7 per cent.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Freight	$5,675,731	$6,195,971	D. $520,240	8.4
Passengers	2,812,705	2,461,771	I. 350,934	14.3
Mail	119,203	103,419	I. 15,784	15.3
Express	126,071	121,564	I. 4,507	3.7
Miscellaneous	66,776	68,650	D. 1,874	2.7
Total	$8,800,486	$8,951,375	D. $150,889	1.7
Expenses	6,732,096	5,738,751	I. 993,345	17.3
Net earnings	$2,068,390	$3,212,624	D. $1,144,234	35.6
Gross earn. per mile	9,269	11,195	D. 1,926	34.4
Net " "	2,178	4,018	D. 1,840	45.8
Per cent. of expenses	76.50	64.11	I. 12.39	.....

Expenses include taxes, which were $215,802.69 in 1881, and $197,255.52 in 1880. The mileage in 1881 was greater by 150 miles than in 1880. The decrease in earnings, it will be seen, was due entirely to the lower rates received last year, traffic of all kinds showing a very considerable increase. The very low freight rates were, however, entirely on through business, the local rate showing a small gain.

The income account was as follows:

Net earnings, as above		$2,068,390.37
Interests and dividends on investments		133,845.35
Total		$2,202,235.72
Interest, main line bonds	$763,420.00	
" leased line bonds	745,196.38	
Rental, leased lines	184,310.00	
Dividends, 2½ per cent	468,455.10	
		2,161,381.48
Surplus for the year		$40,854.24
Balance from 1880		305,964.93
Balance, Jan. 1, 1882		$346,819.17

There were expended for construction account the following sums, not included in expenses: Second track, $75,852.36; land, etc., at Grand Rapids, $10,650.00; new yards at Detroit, $151,786.51; total, $238,289.87.

Renewals included 392,828 new ties; 20.85 miles of track ballasted and 336.61 miles of fence built. Nine locomotives were built in the shops and 8 bought. The equipment acquired with the Detroit & Bay City road included 18 engines, 18 passenger-train cars and 667 freight cars. There were 18 caboose cars built in the shops last year.

The President's report says: "The capital stock remains unchanged at $18,738,204.

FUNDED DEBT.

"The following changes have occurred in the funded debt:

"The sinking fund trustees have purchased $3,000 of the first sinking-fund, and $5,000 of the second sinking-fund bonds—a total of $8,000.

"The Trustees of the Jackson, Lansing & Saginaw Railroad northern extension 8 per cent. bonds have called in and, with proceeds of land sales, paid and canceled $196,000, which completes the retirement of that issue.

"The Jackson, Lansing & Saginaw Railroad Company, having completed the extension of its road to the Straits of Mackinaw, issued thereupon 6 per cent. extension bonds to the amount of $1,100,000, the payment of which is guaranteed from the proceeds of land sales, by the modified agreement of that company. The interest is guaranteed by this company in its lease of the Jackson, Lansing & Saginaw property.

"From April 1, 1881, this company leased the Detroit & Bay City Railroad, and assumed its debts, for which Michigan Central 50-year 5 per cent. bonds, secured by a first mortgage on the Bay City property, were issued to the amount of $3,576,000; there also remain outstanding 424 bonds of the original issue of the Detroit & Bay City Railroad Company, which, prior to the sale of the property in February, 1881, were secured by a first mortgage thereon, and also by the guarantee of this company, but which, since the sale, hold no lien upon the property, and are valuable only for the guarantee above mentioned; they are, however, exchangeable for 424 bonds of the new issue, which are held for that purpose, and when so exchanged, will increase the present issue to $4,000,000.

"The result of the year's improvements and additions to the property is very satisfactory, the especial features of which are the largely increased terminal facilities at Detroit Junction, the construction at the company's shops of new and additional locomotives, the construction of new second track, new iron bridges, new buildings, etc.

OPERATION.

"The freight traffic shows an increase of 54,400,000 tons moved one mile, or 7.40 per cent over the previous year; while the earnings, on account of the prevailing low rates incidental to the sharp contest between the trunk lines, from the effects of which this company could not separate itself, record a decrease of $520,000, or 8.40 per cent. Had the rate of 1880 been obtained on the traffic for 1881, the net revenue therefrom would have been $970,000 (equal to over 5 per cent on the capital stock) greater than it now is.

"The passenger traffic also shows an increase over the

previous year of 20,200,000 passengers moved one mile, or 17.47 per cent, and of earnings $350,900, or 14.26 per cent.

"The operating expenses show an increase over those of 1880 of $993,000, or 17.31 per cent, which, however, is very favorable, when compared with the increased cost of labor, materials and fuel, which is 27 per cent; in this connection it will be observed that the operating expenses include the cost of 10,000 tons of new steel rails (an increase over the previous year of 5,300 tons), the cost of nine new and additional locomotives and the cost of four new iron bridges.

CONSTRUCTION.

"The increase in construction since our last report, including the entire system, is $3,779,328.76, of which amount $3,541,038.89 is for the acquirement of the Detroit & Bay City Railroad; the remaining amount of $238,289.87 is for costs of lands, new yards and buildings for additional terminal facilities, new second track, right of way and gravel pits.

"Included in the above acquirement of the Detroit & Bay City Railroad are 350 new box freight cars and two new locomotives, which have been added to the equipment, as received with the Bay City property.

"The inventory also includes eight new locomotives which have been added to the equipment of the Jackson, Lansing & Saginaw Railroad, and paid for by that company from the issue of its bonds previously mentioned.

FINANCIAL RESULTS.

"The business of the year and its comparison with the two previous years are fully set forth in the following table, gross revenue including interest received from investments:

	1881.	1880.	1879.
Gross revenue	$8,934,332	$9,085,749	$7,415,429
Working expenses	6,732,096	5,738,751	4,699,593
Interest and rentals	1,692,926	1,569.430	1,587,782
Guaranteed interest	.....	16,980	33,920
Jackson accident	.....	70,000	.....
Total charges	$8,425,022	$7 395,161	$6,321,295
Net balance	$509,310	$1,690,588	$1,094,134
Dividends	468,455	1,499,056	1,030,601
Surplus	$40,855	$191,532	$63,533
Rate of dividend	2½ per ct.	8 per ct.	5¼ per ct

"After charging to income account the usual disbursements for operating expenses, extraordinary repairs, renewals, interest, rentals and dividends, an increase is shown for the year of $40,854.24, making the balance since 1878, $346,819.17. By a comparison of the construction account with the capital stock and funded debt of the company, it will be seen that $343,473.87 of such balance has been expended on the property of the company."

Chicago, Milwaukee & St. Paul.

The report of this company for the year 1881 shows that at the close of the year it operated 4,217 miles of road, an increase of 442 miles during the year. The average mileage worked for the year was 3,830 miles. The additions made are noted more fully below.

The equipment consists of 527 locomotives, 207 passenger, 27 sleeping, 6 parlor and 135 baggage, postal, mail and express cars; 11,036 box (including caboose) cars, 1,419 stock cars, 4,285 flat and coal cars, 32 wrecking and tool cars.

The Land Department reports that the company has received in all 418,875.87 acres in Iowa, and 324,014.56 acres in Minnesota. The total sales from these grants have been 232,344.13 acres in Iowa and 9,587.84 in Minnesota, leaving the land owned Dec. 31 at 186,531.74 acres in Iowa and 314,426.72 in Minnesota. The total amount of sales made to Dec. 31, 1881, was 1,012,111.23; the amount of cash received on sales and contracts was $386,825.15; rebates allowed for breaking land, $63,571 61. The amount due on land notes and contracts was $757,745.76. The expenses of the Land Department, including taxes paid, amounted to $87,330.59.

The general account was as follows:

Stock, common		$20,404,261.00
" preferred		14,401,483.00
Total		$34,805,744.00
Funded debt		79,059,000.00
Incumbrances assumed	$6,755.00	
Bills payable	2,490,397.40	
Unpaid vouchers and pay-rolls	2,161,108.85	
Miscellaneous accounts (current balances)	1,401.850.01	
Unpaid dividends and interest	118,726.92	
		6,178,838.18
Income account, balance		5,593,010.85
Total		$125,636,593.03
Cost of road	$120,073,629.99	
Stocks, bonds and investments in leased and controlled roads	1,683,023.25	
Illinois and Iowa coal lands	503,118.92	
Materials on hand	1,028.763.99	
Bills, accounts and balances receivable	663,640.95	
Cash due on stock subscriptions	1,129.215.00	
Cash on hand	555,200.93	
		125,636,593.03

The bonded debt, as it stood on Dec. 31, 1881, is included in 23 issues; the consolidated bonds amounted to $11,738,000, the other issues being secured on various divisions of the road. The yearly interest charge is $5,077,020.

The charges in bonded debt during the year have been very considerable; they are shown in detail in the following table:

	1881.	1880.	Inc. or Dec.
Consolidated bonds	$11,738,000	$10,133,000	I. $1.605,000
La Crosse Div., first	5,673,000	6,500,000	D. 827,000
Iowa & Minn., first	3,431,000	3,681,000	D. 450,000
Prairie du Chien, first	3 674,000	3,674,000	.....
" " second	1,300,000	1,315,000	D. 15,000
Chi. & Milwaukee, first	2,494,000	2,500,000	D. 6,000
St. Paul Div., first	3,998,000	4,000,000	D. 2,000
Iowa & Dakota, first	558,000	582,000	D. 24,000
Iowa & Dak. Extension, first	3,814,000	4,226,000	D. 412,000
Hastings & Dak., first	97,000	121,000	D. 24,000
Hastings & Dakota Extension, first	5,290,000	4,060,000	I. 1,230,000
Southwestern Div., first	4,000,000	4,000,000	.....
La Crosse & Davenport, first	2,500,000	2,500,000	.....
Chicago & Pacific, first	3,000,000	3,000,000	.....
Chicago & Pacific Western, first	9,200,000	.....	I. 9,200,000
So. Minnesota, first	7.203,000	6,800,000	I. 403,000
Dubuque Div., first	6,152,000	6,022,000	I. 130,000
Mineral Point, first	2,160,000	1,200,000	I. 960,000
Wisconsin Valley, first	1,700,000	1,700,000	.....
Second-mortgage bonds	387,000	387,000	.....
Minnesota Central	123,000	183,000	D. 60,000
Milwaukee & Western	215,000	215,000	.....
Land grant income bonds	352,000	373,000	D. 21,000
Total	$79,059,000	$67,172,000	I. $11,887,000

There are also $1,109,745 Wisconsin Valley Railroad Company bonds, bringing up the total to $80,168,745. Of the issues named above $3,674,000 bear 8 per cent. interest; $1,300,000 bear 7.3 per cent.; $38,170,000 bear 7 per cent.; $22,055,000 bear 6 per cent., and $13,860,000 bear 5 per cent. interest.

The traffic for the year was as follows:

Train-miles.	1881.	1880.	Increase.	P. c.
Passenger	3,489,438	2,773,287	716,151	25.8
Freight	9,762,800	7,172,147	2.590,653	36.1
Service	1,714,292	1,040,529	673,763	64.7
Total	14,966,530	10,985,963	3,980,567	36.2
Passengers carried	2,985,885	2,127,501	858,354	40.4
Passenger-miles	137,940,086	111,561,919	26,378,167	23.6
Tons freight carried	4,276,088	3,260,563	1,015,525	31.1
Ton miles	.697,347,607	504,876,154	192,471,453	38.1

Freight-train mileage includes switching. Of the ton-miles 51.02 per cent. were of east-bound and 48.98 per cent. of west-bound business.

The receipts per train-mile and per unit of traffic, etc., were as follows, in cents:

	1881.	1880.	Inc. or Dec.	P. c.
Earnings per train-mile, passenger	113.00	114.00	D. 1.00	0.9
Earn. per train-mile, freight	122.00	124.00	D. 2.00	1.6
Expenses per mile run, all trains	78.00	78.00	.....	.....
Maintenance of way per mile run	15.60	19.30	D. 3.70	19.2
Motive power per mile run	25.40	20.90	I. 4.50	21.5
Receipt per pass. mile, east	2.92	2.92	.....	.....
" " " west	2.81	2.76	I. 0.05	1.4
" " " average.	2.86	2.84	I. 0.02	0.7
Receipt per ton-mile, east	1.69	1.81	D. 0.12	6.6
" " " west	1.72	1.71	I. 0.01	0.6
" " " average.	1.70	1.76	D. 0.06	3.4

The average rate per ton per mile received for freight for 17 years past has been as follows:

	Cents.		Cents.		Cents.
1865	4.11	1871	2.54	1877	2.08
1866	3.76	1872	2.43	1878	1.80
1867	3.94	1873	2.50	1879	1.72
1868	3.49	1874	2.38	1880	1.73
1869	3.10	1875	2.10	1881	1.70
1870	2.82	1876	2.04		

The average rate in 1881 was 40.3 per cent. of that for 1865.

The total extraordinary expenses, for additions to the property, were $4,744,561.38, the chief items being $3,289,-141.96 for new equipment; $422,089.37 for real estate in Chicago; $344,544.78 for new sidings; $166,829.99 for new car-shops at Milwaukee; $137,385.81 for new elevator and grounds at Minneapolis, and $97,193.50 for real estate in Milwaukee. These expenses do not include anything for construction of new road.

The earnings for the year were as follows:

	1881.	1880.	Inc. or Dec.	P. c.
Av. miles worked	3,830	2,923	I. 907	31.2
Freight	$11,884,796	$8,884,227	I. $3,000,569	33.7
Passengers	3,938,989	3,159,051	I. 779,938	24.7
Mail, express, etc.	1,201,677	1,042,841	I. 158,836	15.4
Total	$17,025 462	$13.086,119	I. $3,939 343	30.1
Expenses	10,317.931	7.742,426	I. 2,575.505	33.3
Net earnings	$6,707,531	$5,343,693	I. $1,363,838	25.5
Gross earnings per mile	4,445	4,477	D. 32	0.7
Net earnings per mile	1,751	1,828	D. 77	4.3
Per cent. of expenses	60.92	59.16	I. 1.76	

The increase in earnings was fair, and the earnings per mile were more nearly maintained than might have been expected with so much new road.

The income account was as follows:

Balance, Jan. 1, 1881		$4,343,283.16
Less dividend of April 15 (3½ on all stock)		973,306.04
Balance		$3,369,977.12
Net earnings for the year		6,707 530.52
Interest and other income		324,112.14
Cash from land sales		311,196.22
Total		$10,712,816.01
Interest on bonds	$4,127,389.12	
Dividend of Oct. 15, on preferred stock, 3½ per cent	453,266.90	
Dividend of Oct. 15, on common stock, 3½ per cent	539,149.14	
		5,119,805.16
Balance, Jan. 1, 1882		$5,593,010.85

The net receipts for the year (including interest and land sales) were $2,223,033.73 in excess of the amount paid for interest and dividends during the year.

CONSTRUCTION.

President Mitchell's report says: "During the year the company has constructed the following branches and extensions:

"In the state of Illinois a line from Rockton to Rockford, 16 miles; Braceville coal track, 1 mile.

"In the state of Wisconsin a line from Mazomanie on the Prairie du Chien Division to Prairie du Sac, 10 miles; from Monroe to Shullsburg, 34 miles.

"In the territory of Dakota the Iowa & Dakota Division has been extended to the Missouri River at Chamberlain, 13 miles; the Southern Minnesota Division from Dell Rapids to Sioux Falls, 19 miles; the Hastings & Dakota Division has been extended west to Aberdeen, 30 miles, and thence up the James River north from Aberbeen, 40 miles, and its Whetstone Branch, running northwest from Milbank Junction, has been extended 11 miles. There has also been constructed in the James River Valley, south from Aberdeen, 33 miles of track, and on the line west from Flandreau 22 miles, from Madison to Howard.

"In the state of Iowa a branch has been constructed from the Iowa & Dakota Division at Emmetsburg northwest 15 miles. The Chicago & Pacific Western Division has been extended west towards Council Bluffs from Marion, 198 miles.

"Making the aggregate construction for the year 442 miles, which, added to the 3,775 miles previously owned by the company, makes it the owner of 4,217 miles of completed railway.

"On the extension from Marion to Council Bluffs 64 miles of track remain to be laid; and when this is done, as it will be by next July, the company will have a line between Council Bluffs and Chicago not inferior to that of any other company in any respect, and passing through a populous country remarkable for its fertility.

"The largely increased business of the company has made necessary the purchase of additional grounds for yard, dock and depot purposes in Chicago and Milwaukee and at other terminal points on the lines of road, and there have been expended for that purpose during the year the following sums:

At Chicago	$422,089.37
At Milwaukee	97,193.50
At Minneapolis	41,901.75
At St. Paul	5,142.30
At other points	9,101.43
Total	$575,428.35

"A cheap and reliable supply of fuel to meet the large and growing wants of the company has been deemed by the directors a matter of the greatest importance, and they have therefore caused to be purchased 3,000 acres of coal lands at Braceville, 61 miles southwest from Chicago, at a cost of $293,000, and 2,000 acres of coal lands near Oskaloosa, Ia., at a cost, including improvements, of $210,000. From these fields the company is now receiving daily supplies.

"The company owns in Northern Iowa and Southern Minnesota 500,000 acres of excellent land, for which there is at present an active demand at an average price of about $6 per acre, and there is due to it on account of land sales already made the sum of $757,745.

"The company has now 1,239 miles of road laid with steel rails, being an increase of 418 miles the past year; and the following new equipment has been added: 103 locomotives; 36 passenger, 2 parlor and 10 sleeping cars; 1,850 box and 1,500 flat cars.

CAPITAL.

"The entire cost of the company's property, including the rolling stock, depot grounds, cattle yards, elevators, warehouses, docks and coal lands, is represented by:

Common stock	$20,404,261
Preferred stock	14,401,183
Total stock	$34,805,744
Mortgage bonds (including $1,109,745 bonds of the Wisconsin Valley Co)	80,168,745
Total bonds and stock	$114,974,489

"This total amount of bonds and stock on 4,217 miles of road is at the rate of $27,264 per mile.

"The preferred stock of the company was increased during the year $1,997,000 by the conversion of mortgage bonds and stock, as provided by the articles of association and the terms of the bonds.

"In accordance with authority from the stockholders, the common stock was increased by $5,000,000, which was issued at par to the stockholders who subscribed for the same.

"In the regions of country traversed by the lines of this company, the year 1881 has been the most unfavorable for railroad operations that has hitherto been known. The oft-recurring snow blockades of winter and the continuous rains of autumn have caused a large expense and serious interruption to business.

"The purchase of the several roads acquired by this company and the construction of their connecting lines, together with extensions of our main line, make a system of railroads covering, in well-adjusted distances, an immense extent of the most fertile and productive country in the world, susceptible of continued yearly increase in its population and productions, giving to this company a promise of future development unequaled by any other railroad system, and working together so harmoniously as to render its possibilities for economy and cheapness of operation unsurpassed."

New York, Susquehanna & Western.

This company was organized June 23, 1881, by the consolidation of the Midland, of New Jersey, the Paterson Extension, the Midland Connecting, the North Jersey, the Water Gap and the Pennsylvania Midland companies. The report covers the operations of the completed road for the entire year 1881.

The road owned extends from Marion Junction, N. J., to the New York state line near Unionville, 71 miles, and the company leases the Middletown, Unionville & Water Gap road, from that point to Middletown, N. Y., 14 miles. The trains use the Pennsylvania Railroad track from Marion Junction to Jersey City, 2½ miles.

The equipment consists of 17 locomotives; 15 passenger, 6 combination and 3 baggage, mail and express cars; 11 milk, 2 produce, 5 hay, 32 box, 1 stock, 21 lime, 69 gondola, 47 flat, 55 ore and 5 caboose cars; 10 gravel, 1 derrick, 1 tool and 1 flanger car; 1 steam shovel.

The report gives no balance sheet and no statement of securities. The capital account has been in a transition state and is not yet fully arranged and settled.

The earnings for the year were as follows:

Freight	$267,031.85
Milk	192,431.24
Passengers	152,442.68
Mail, express, etc	28,945.56
Total ($7,539.43 per mile)	$640,851.33
Expenses (66.23 per cent.)	424,423.54
Net earnings	$216,424.79

Expenses include the amounts paid for the use of the Pennsylvania track and terminal facilities in Jersey City.

No statement of the disposition of net earnings is given.

The General Manager reports 24 miles of steel rails and 78,996 new ties used in renewals; 3,457 ft. new sidings were built; four miles wire fence built; several trestles and bridges rebuilt; several stations painted and other improvements made. The equipment was kept in good repair and one engine rebuilt.

President Pott's report says: "The extensions now being constructed from Two Bridges, N. J., to Gravel Place, Pa., the point of intersection with the Delaware, Lackawanna & Western Railroad, and the necessary extensions in the Lackawanna Valley, connecting the coal operations of the company with the main line of the Delaware, Lackawanna & Western Railroad Company, are all being prosecuted vigorously.

"A favorable traffic contract has been consummated with that company, obviating the necessity of further extensions on our part, beyond the point of intersection with them near Stroudsburg, Pa., and insuring us perpetually advantageous terms for the mutual interchange of business.

"Desirable terminal facilities for our coal traffic are provided under the contract with the Delaware, Lackawanna & Western Railroad Company.

"For all other kinds of traffic the company has made its arrangements with the Pennsylvania Railroad, whose facilities and conveniences are unrivaled.

"The completion of the Paterson Extension Branch (about 1 mile) will enable us in the future to command a large share of the business of this flourishing manufacturing city—now containing upwards of 60,000 inhabitants—from which, owing to our unfavorable position, we have heretofore had but little benefit.

"As provided by the articles of consolidation, the stock of the Midland Railroad Company, of New Jersey, is exchangeable, at par, into the preferred stock of this company.

"Subsequently this company extended the privilege to the junior security holders of that company, to convert their several securities into its common stock, upon the following terms:

"Income bonds, Class A, to be exchanged at par. Income bonds, Class B, to be exchanged, at par, upon the payment of 5 per cent. assessment.

"Scrips Nos. 1 and 2 to be exchanged, at par, by the payment of 7½ and 10 per cent. assessment, respectively.

"A large proportion of these securities have already been exchanged for the common stock; and in view of the early completion of the road, it is expected the balance will be promptly converted."